

Mini maker moves into franchising

by Andrew Thomas
MINICOMPUTERS are being marketed through a network of franchises in a novel move by minicomputer manufacturer Computer Automation.
It is aiming for 150 franchises in Europe and the Middle East, and has already appointed 40. They will initially sell its Omnix small business system, which confusingly has the same name as a now-defunct Unix look-alike.
Franchising differs from distributing in that CA provides complete systems, including software, which are offered to vertical markets, rather than providing components on an OEM basis. CA hopes that franchising will result in large numbers of systems houses installing its hardware.
Holders of franchises will make money on the substantial (up to 45%) discounts offered. In addition, the franchisee receives sales aids, training, and complete administrative documentation.
The Omnix system is based on the Naked Mini 4/04 16-bit processor. A standard system, comprising three terminals, a 120 print position line printer, 64Kbytes of RAM, and two one-Mbyte floppy disks, sells for under £5,000 in quantities of 25 or more.
Mike Brown, European general manager of CA's OEM division, sees Omnix competing with £20,000 minis in the rapidly growing market for "superminis" which, it is estimated, will be worth \$5 billion by 1986.
"Omnix is aimed at the second-time user," says Brown, "the people who have experienced res-

trictions with simple 8-bit micros, and are now in a position to make a more objective decision as to what they require from a system.

"The first-time user is primarily concerned with cost, while those seeking to upgrade are more interested in performance."

Full production of Omnix started in January, and there are already 500 orders, with 25 systems in use by franchise holders. The system comes with a new multi-user operating system called Opus-1, which supports both background and interactive processing combined with multi-tasking and multi-user capability.

Also featured is a multi-level priority system, dynamic store allocation, automatic spooling, and dynamic peripheral assignment. System utilities include disc initialization and copying, a source editor and compiler, and printing facilities.

Brown says that Unix will be available later, but that any enhancements will maintain the upgrade path through the Naked Mini range.

Maintaining CA's presence in the OEM market is Workstation 1, the first of a new series of desk-top 16-bit micros. OEMs and distributors can buy a complete system, or opt for any of the component parts, allowing, for example, the use of other manufacturers' disc drives.

Both Omnix and Workstation 1 are currently manufactured in Dallas, but the plan is to transfer production to CA's plant in Dublin as soon as possible.

"Omnix is aimed at the second-time user," says Brown, "the people who have experienced res-



BROWN... Competing with £20,000 minis in supermicro market.

Chance to answer back

by Donald Kennett
A TELESOFTWARE and publishing service for microcomputers which allows users to channel their comments back to software authors is to be launched by Commodore.

Called Petnet, the "bulletin-board" service is based on ADP Network Services' nationwide bureau network.

Petnet designer Nick Green, Commodore's special projects manager, said Petnet would provide the sort of software publishing utilities that should exist for microcomputer users.

Petnet takes conventional development tools for granted, Green said, and concentrates on providing

feedback to software authors from the people who buy their products.

The network enables authors to make their programs available at a cost up to £999.99. Purchasers can open a comment window while running software to record a satisfaction rating and a comment.

The comment can be the cure for a bug in the program, which the purchaser can in turn charge for. Commodore will then fund the service by raking off 10% to 15% of the money that passes through the system.

The basic cost of using the service is likely to be between 20 and 30p a month per 1,000 characters stored.

Rival giants invest in each other

by Kevin Cahill
DESPITE increasing unease in America about the share of the world's high technology markets which Japanese companies are winning, investment by Japanese and American companies in each other's countries is booming.

A survey carried out by the Japan External Trade Organisation, Jetro, shows that Japanese companies had invested over \$8.8 billion in manufacturing facilities in the United States up to the end of 1981. Most of the investment, especially recently, has been in the field of computers and semiconductor technology.

According to Jetro, the share of Japanese overseas manufacturing carried out in the US rose from 25.8% in 1976, to 43.5% at the end of 1980.

There are over 300 Japanese companies manufacturing in the US, with average employed capital of \$8.6 million and an average 200 employees each.

Three of the most recent entrants are Fujitsu, NEC and Hitachi, which have all begun semiconductor manufacturing in the US. NEC will be concentrating on 64K dynamic RAM production.

The Japanese computer industry itself was dominated by American companies until the year before last, when Fujitsu finally wrested the top slot from IBM. But whereas very few American computer companies ever set up actual manufacturing facilities for the computers themselves in Japan, many of them have established semiconductor plants.

Texas Instruments has increased its Japanese production capacity for 64K RAMs to over one million per month, which is still well ahead of any Japanese company's plans so far announced. The company has also begun mass production of 8-bit and 16-bit microprocessors in Japan.

Last year Intel set up a new head office in Tokyo which cost it well over \$14 million, and now has an estimated 70 design staff there.

The company, which began marketing 16-bit microprocessors from its Japan plants last year, also announced that it was considering a new semiconductor facility in Japan. Gordon Moore, Intel's chairman, said that his company could "hoist the go sign" for the new plant as early as 1983.



MOORE... Go-sign for new plant as early as 1983.

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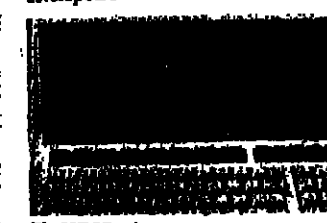
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NEWS BRIEF

HP challenge to IBM with £3,000 micro

HEWLETT-PACKARD has launched a microcomputer to compete against IBM's Personal Computer and Apple III. The HP87 is aimed at the analytical, technical market rather than the commercial user, and will sell for just over £3,000 in the UK complete with disc and printer.

It is not based on a 16-bit, unlike IBM's machine, and does not offer CP/M as a standard option, though a plug-in module is available which should allow the HP87 to run a wide range of applications programs as well as the systems developed for the HP85.



The HP87 micro.

Three for PAYE

COMPETITION to supply the 100 terminals for the PAYE assessment project is now down to three companies following the withdrawal of Olivetti. The companies in the race for business worth up to £25 million are ICL, Ferranti and Plessey.

Printer boost

MIDDLESEX-based Data Recording Equipment, the National Enterprise Board-owned print and magnetic media manufacturer, has beaten Japanese and American competition to supply 750 printers to microcomputer supplier AI Microcomputers. AI is Japanese but the printers will go to buyers of its machines in the UK.

£3m education

MORE than £3 million a year is being spent on the Microelectronics in Education programme that was announced early last year, according to a statement in the Commons by Dr Rhodes Boyson, Under Secretary of State for Education.

Acorn user group

AN independent user group for the long-awaited Acorn/BBC microcomputer has been formed in St Albans. Beebug will provide the normal user group activities - advice, discounts, competitions - and a magazine.

IT centres soon

MOST of the 30 information technology centres will be opening in the next two or three months, Information Technology Minister Kenneth Baker reported to Parliament.



PERCIVAL: "Support goes on."

Magnuson fires UK sales staff

by Boris Sedacca
TROUBLED Magnuson has effectively dropped out of the European market for IBM plug-compatible mainframes by making its whole UK sales force redundant. A potential customer in West Germany, Storbach in Lubek, has had its machine removed during evaluation trials.

Magnuson has been hit by the news that fourth quarter of 1981 losses, previously forecast at \$10 million, have doubled to near \$20 million, and its whole future is in doubt following the breakdown of merger talks with Storage Technology.

The knock-on effect has now been felt in the UK and Peter Percival, who is head of European operations and has just re-assumed the former position of UK managing director, has made redundant his entire salesforce of 20 people out of a staff of 30.

The local Magnuson operation is independent of the US corporation and acts as the exclusive UK distributor. Percival's plans to expand into Europe were short-lived and Mike Tucker, recruited to replace him in the UK, spent only six weeks in his position.

Govt rejects 'Buy British micros' plea

by Robert Parry
THE revised list of approved suppliers of microcomputers to the government will not deliberately favour British companies. BEC regulations on competition are being cited as the reason.

The Central Computers and Telecommunications Agency (CTTA) is to award continuing contracts to supply microcomputers in three categories. The number of companies favoured may be increased from the present nine to a maximum of 12, which gives hope for more UK suppliers, but the CTTA is sticking strictly to the letter of BEC regulations preventing preferential treatment.

Only three weeks ago Information Technology Minister Kenneth Baker rejected calls from the National Economic Development Council for more direct government support, but called on managers to "take investment and procurement decisions with the long-term objectives of UK industry in mind".

He is also committed to what he dubs "enlightened public procurement".

Commenting on the buy British calls, Gerald Watson, director of the CTTA, said: "We are not against it, certainly. But there is no way, at the end of the day, you can choose nine British companies."

If all things were equal, though, buying British would sway things, Watson added. Also in British companies' favour is that they ought to be more responsive than



WATSON... "No way to choose nine British firms."

people importing in providing support over the wide geographical area to be covered, he said.

The CTTA list was drawn up a year ago and contained three companies in each of three categories, covering machines up to £2,500, up to £5,000 and over £5,000. This time round the categories have been changed, "rationalised with hindsight" according to Steve Swanks, who heads the CTTA's microcomputer operation.

The nine companies originally chosen were Research Machines, Microsense (now Apple Comput-

ers) and Commodore; Casu, Modata and Thame; Equinox, Wilkes Computing and B M G Microsystems. BMG went out of business at the end of last year and applications are being transferred to other systems on the list.

The two top groups are combined, and there is now a "scientific" group.

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Move to cut out agencies

by Philip Hunter
AN attack on the business of contract recruitment agencies is under way from a new directory, which aims to cut them out of the chain between prospective employer and contractor. But one of the first advertisements to attract entries from contract staff for the directory has provoked an angry response from some agencies.

They are upset that the wording of the advertisement suggests that contractors working for their own limited company will have tax deducted at source by the agency after 1982, as a result of government legislation.

The row stems from an advertisement appearing in Computer Weekly on February 18, 1982, which claimed that it was almost certain that contracting companies who find work through agencies would have 30% of their income deducted from April 5, 1982.

However, the Treasury has already said that it definitely will not be introducing such legislation to take effect from April 1982.

The directory in question, called the National Computer Contract Directory and published by London-based DP Recruitment Ltd (DPRL), will be published in April this year.

The controversial advertisement contained an application form for potential contractors to submit CVs free of charge for inclusion in the first edition of the directory, to be published annually with quarterly supplementary updates.

It claimed to offer clients the opportunity of approaching contractors directly and therefore saving the agency fee.

"It was not our intention to give the impression that contracting companies would definitely have tax deducted at source after April," says DPRL director Thomas Kay.



BARBER... AS 9000 producing "widely differing work outputs."

Japanese arm for first IBM industrial robot

by Boris Sedacca
IBM's first move into industrial robotics will be based on a low-cost Japanese mechanical arm, which will be controlled by its personal computer.

The arm is built by a Tokyo-based company called Sanyo Seiki Manufacturing and will sell for \$28,500 with an IBM badge describing it as the 7535. IBM hopes to begin shipments of the device towards the end of the year.

According to Laura Conigliaro, robotics expert with Wall Street analyst Bache, the 7535 is Sanyo Seiki's Selective Compliance Assembly Robot Arm, Scara.

Conigliaro said the Scara category of robot moves mostly in a horizontal plane and is best suited for assembly jobs.

"Dexterity is of secondary importance in the case of this device, but it is suited to fast production work. Machines with more degrees of freedom have superior dexterity but are not designed for high-speed work," she added.

The IBM 7535 has four "degrees of freedom" or axes of movement, but a more advanced robot, the RS1, will have six. Conigliaro predicts that the RS1 will be a "rectangular robot", that is, it will operate in a rectangular plane. It will have a five-pointed payload and will use a hydraulic drive. Scara is simple and sells for less, she said.

Conigliaro believes also that IBM is interested in making its language, A Manufacturing Language, the standard industry language for robotics.

More dissatisfaction with NAS systems

by Boris Sedacca
A USER of plug-compatible mainframes in the IBM 3081 class has added to the growing body of evidence that the machines are not realising their full power potential.

This follows last week's revelations that five prominent German industrial groups have joined up to complain of shortfalls in the performance of IBM 3081s.

OCL, the largest UK container shipping group, has found that it is not getting full processor utilisation from its AS 9000, the IBM 3081 plug-compatible equivalent from National Advanced Systems.

But the company has emphasised that its performance shortfalls are due to the number and type of jobs it is running rather than any inherent problems in the machine's architecture.

"We carried out benchmarks with a limited amount of storage on the AS 9000 at Guardian Royal Exchange before we bought our own machine, and the figures we got suggested that the AS 9000 was five times more powerful than our IBM 370/158 multiprocessor configuration operating at 1.7 million instructions per second," explained Anton Ratnayake, OCL data centre manager.

But this figure is based on selected applications and OCL found that when it brought in the rest of its workload, it could not achieve the full power of the AS 9000.

Brian Barber, head of management services and Ratnayake's boss, added that he never expected that everything would run at 11 mips, the rated power of the machine.

"We get widely differing work outputs. Substantially everything

runs at eight to 11 mips. We only just got used to our 158 which was fine-tuned like a fiddle to give us 98% processor utilisation.

"We have not got to this stage on the AS 9000 and we are relying on new boys in tuning it. We have yet to optimise our channel memory and so on," he said.

● Kevin Pearson adds: OCL experiences do not fit the picture of performance problems with IBM 3081 computers. Their main problem has been insufficient input/output, for the speed of the processor.

This was evident with the previous top of the range IBM compatible systems, including IBM's own 3033, and has been exacerbated by the new generation of high performance computers like IBM's 3081 and NAS's AS 9000.

HP launch a challenge to DEC

by David Craver

MORE lines have been drawn in Hewlett-Packard's strategy to dominate the supply of systems to the manufacturing community. Two new real time computers designed primarily for OEMs have been released at the bottom-end of its technical family of systems, which puts HP in head-on competition with Digital Equipment.

"The thrust is at the technical environment," says field marketing manager Tony Hart, who describes DEC as the "establishment". The new products will mainly be used by hardware OEMs to integrate into machinery such as numerical control, and to a lesser extent by software OEMs, Hart adds.

Both releases are in the HP1000 series: the A600 is a full-function microcomputer with a cost of less than £1,500 in OEM quantities of 100; and the A700 is a mini which HP says can perform up to 450,000 floating point operations per second and will cost under £6,400 in quantities of 100.

The systems use new main processors. That contrasts with the top-end HP1000 Value 65 announced last month, which was an enhancement to an existing range. The A-series central processor is implemented by four Schottky bipolar bit-slice microprocessors, and both have a new real time operating system, RTE-A1.

At the bottom of the 1000 family



HART... Hewlett-Packard taking DEC head-on.

is the L-series, released some 18 months ago, and which competes against the PDP-11/23. The A600 and A700 are positioned against the PDP-11/34 and 11/44 respectively, Hart says.

Hart points out that the Value 65 is not an OEM machine, and that it is not made obsolete by the introduction of new processors lower down the range. But with

HP's announcement that it has a 32-bit processor in prototype stage, there are bound to be further developments at the top end soon.

HP claimed the Value 65 was the first 16-bit machine to have virtual memory for data capability, and it claims the A600 is in turn the first microcomputer with such power.

High Street viewdata is Debenhams' aim

by Donald Kennett

VIEWDATA in every major High Street retail shop is the aim of Debenhams Interactive Systems Company (Disc), the newly launched subsidiary of the Debenhams chain. Debenhams owns 170 shops, including Hamleys toys and Lotus shoes.

The company has teamed up with CMC and Computex to develop Viewbase, which integrates Computex's private viewdata system with CMC's Procs interactive database system.

CMC's managing director Jerry Cawley claims it is the first viewdata system to be integrated with an interactive database.

Expensive tailoring is needed to link other viewdata systems' gateways to databases, he says.

Disc's managing director David O'Malley believes the system will make a reality of Viewdata's early promise of limitless applications.

"You cannot input data, collect it, update files immediately, search for the data you want, analyse it and present it to the user in any way he wants - it is not sur-

prising the viewdata market is characterised by people scratching their heads over what they want," he says.

Viewbase does support these functions, he says. It is also possible to write programs on the system using a viewdata terminal with an alphanumeric keyboard, or to enter complex database inquiries using CMC's inquiry language misleadingly called English.

Debenhams has spent 18 months researching in-house applications while the system was under development. "This is not a supplier's system, but comes from users in the real world," says O'Malley.

One of the early uses has been to provide all directors and managers with summaries of each week's activities which they access on Sunday evenings from their home terminals. Another is to provide performance information such as changes in sales-per-square-foot to traders running stalls within Debenhams shops.

Joint development of the system will continue under an agreement with Computex. Enhancements

planned include using microcomputers in shops to pre-process or manipulate data before it is sent into, or after it is collected from, a central system.

And a strong possibility for the medium-term future is that Disc will use Debenhams' 70-node leased line network to provide viewdata-based communications services.

In the shorter term, Disc's product range will include software for processing non-payment problems called Debtor and Litiator, which it uses in-house with up to 800,000 customers at a time.

The Viewbase software costs £18,500 and it runs on hardware costing from £50,000 to £500,000 depending on the capacity and complexity of the system.

For example, Disc has a Digital Equipment PDP-11/70, capable of handling up to 50 simultaneous accesses, providing a front-end to three CMC Reality database machines running different applications. This set-up costs £200,000. Space on this system is offered to small users or for trials.

The features that are extra to



O'MALLEY... "Our system comes from users in the real world."

Prestel-type viewdata give the system access to the biggest untapped market in the country, in O'Malley's view. It consists of 350,000 outlets from 235,000 businesses, 20,000 of them large, he says. It will be worth £80,000 by 1985 and £500,000 by 1990.

"The retailer with 150 outlets has never had any trouble justifying a mini," he adds. "But he couldn't afford the terminals until viewdata. That makes it dramatically different."

The first customer for the

system is shoe manufacturer Clarks, which also owns Peter Lord shops and recently took over K-Shoes. K-Shoes has 325 shops and recently started using a bureau-based voice response system for collecting re-ordering information.

Discussions are in progress with potential customers in the fashion, travel, betting shop and brewery sectors. Apart from retailers, finance companies and potential viewdata service operators are target markets.

Teletext Month in October

by our Parliamentary Correspondent

ANOTHER National Teletext Month will be held in October. John Wakeham, Under-Secretary of State for Industry, told the Commons.

He promised that the Department of Industry, in co-operation with all sectors of industry, would continue to promote teletext and viewdata in 1982 as in 1981.

The UK had a world lead, he said. About 90% of teletext sets sold or rented in the UK had been produced here, and sales were going extremely well.

In the second half of 1981, the number of teletext sets doubled over the total for the previous five years, and he expected the total to double again this year.

● A survey conducted last year has shown that 30% of manufacturing companies in Britain are using or intending to use microelectronics in products and processes. This compares with 5% shown by a survey in 1977. Kenneth Baker, Minister for Information Technology, told the Commons. "This is a considerable improvement but much remains to be done," said the Minister.

IoD brings financial modelling to members

by Kevin Cahill

A FINANCIAL modelling package from ICL may reach up to 30,000 company directors following installation of a single terminal at the Institute of Directors.

The terminal, connected to ICL's Reading computer centre, is used to run one of the modules of a financial planning package which was jointly developed by ICL and consultant Geoffrey Smith. Smith runs a one-man consultancy company near Cheltenham, Glos.

The module being run at the Institute of Directors Business Centre is Strategic Vision, which enables a user to examine and balance factors such as productivity and profitability and look at alternative financial strategies.

The institute is initially planning to use the package in conjunction with a series of in-house courses being run in April and September, but its members will

have access to the package on other occasions.

The installation of the module at the institute is a considerable personal triumph for Smith, who has been plugging both the idea and the product since 1977.

The breakthrough came in 1980 when ICL offered to develop the package in conjunction with the financial modelling language Prosper. It took about fourteen months to complete the software, which includes budgeting and tactical financial planning modules.

Smith reckons that less than 6% of companies in the UK do financial modelling on any scale.

So far 20 customers have bought the package which currently runs on 2903, ME29 and 2900 series hardware.

Later versions will run on the Rair Black Box which ICL is now marketing.



Industry Minister Ken Baker (left) and designer Geoffrey Smith (centre) at the launch of the ICL Strategic Vision service at the Institute of Directors.

HP beaten to the post

by Kevin Pearson

INFOMEDIA, a small California-based service house, has beaten Hewlett-Packard to the market with an electronic mail system for Hewlett-Packard's own HP3000 microcomputer.

The system, called Jenny, costs \$9,800 in the US, and will run on any HP3000 with 128 Kbytes of memory operating under Master Program Executive, HP's commercial operating system for the 3000. The system is menu-driven with some special function keys, and would require no additional

hardware investment for most users, says Infomedia.

The company plans to sell the system in the UK, but is still negotiating a distributorship and no details are available, said a spokesman.

Hewlett-Packard confirmed that it is developing its own electronic mail system, which should be available later this year. Infomedia has considerable experience in the electronic transmission of data. For a number of years it has been offering a teleconferencing system based on Digital's DECsystem 10.

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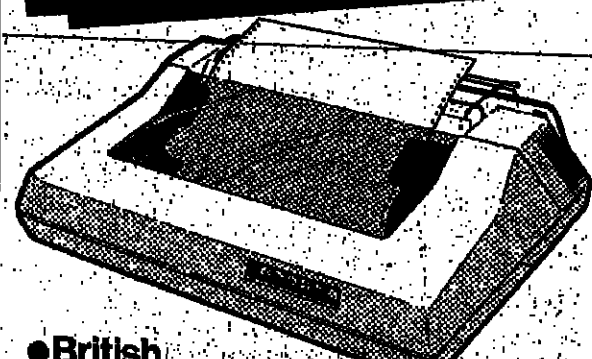
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British Telecom wins first major digital transmission customer

by Donald Kennett

BRITISH TELECOM has come out fighting in the newly competitive business telecommunications market with the securing of its first large order for X-Stream digital transmission services. A £300,000 a year contract has been signed by the Central Electricity and Generating Board which will link private exchanges between its London headquarters and divisional offices on a 1,000-mile network.

X-Stream, announced in January, can be used for sending large volumes of computer data, for video-conferencing, and for interconnecting PABXs.

In the meantime the Mercury telecommunications network, which received its licence from the government last week, hopes to announce its first customer "shortly". It plans to open its first routes early next year in London, followed a little later by its first trunk route, to Birmingham.

The terms of the licence granted to the Mercury consortium (Cable & Wireless, Barclays Merchant Bank and British Petroleum) allow for interconnection with BT's network for both inland and interna-

tional circuits. Mercury will have its own satellite ground station for links to other countries via Intelsat, but the satellite channels themselves will be negotiated on Mercury's behalf by BT International. It may negotiate with overseas telecommunications carriers, but BT will have the right to be present.

The terms for the connections are to be negotiated between Mercury and BT over the next three months. If they fail to agree, the Department of Industry has the power to direct BT on terms.

BT chairman Sir George Jefferson said: "There certainly will not be carte blanche on interconnection. The degree of interconnection will depend on the extent to which we can reach mutually acceptable financial and technical arrangements."

We have to ensure that the economics of our system are not unreasonably affected to the detriment of our customers."

Industry Secretary Patrick Jenkin said: "This will be the first time there has been full competition in telecommunications. We are going further and faster than

any other country including the Americans. Competing firms will offer a variety of services to their customers."

C&W Communications Services managing director John Bird said: "Digital service will enable you to transmit that which is not possible at the moment in terms of images and information. Digital communication is going to introduce a major explosion in terms of the terminal equipment. Instead of having to talk at the speed you and I talk at, you will be able to talk at the speed machines talk to each other at, computers to computers."

Mercury's chief executive designate is Derek Evans, currently C&W's head of telephones. The financial director is expected to come from Barclays Merchant Bank.

British Telecom International last week accepted an £8 million 11,000-line computer-controlled international telecommunication exchange from Plessey Controls. A smaller version of the same type was installed in 1978. The new one, probably the world's largest, could eventually be expanded to 27,000 lines.



JEFFERSON... "No carte blanche on interconnection."

The exchange stores each message until it has been given all the destinations it is to go to and then transmits to each in turn. If a connection is unsuccessful at the first attempt, the exchange re-tries repeatedly without referring back to the sender.

SALES BRIEF

GEC systems to speed the Tubes

LONDON Transport has ordered over £300,000 worth of GEC 400 Series minis for passenger information systems on the Victoria and Northern Lines and the signalling system on the Jubilee Line. The order includes three 400s and two 405s and is to be completed by the autumn.

The passenger information system will drive new displays which show the expected time of arrival as well as the destination of the trains.

Drives for ICL

ICL has placed an order worth several million pounds with CPU Peripherals of Shepperton for 14-inch Winchester and 8-in floppy disc drives. The drives are made by Shugart in the US and ICL will build them into the Perq scientific graphics computer which it is due to start making at its Letchworth factory.

£3m terminals

IBM has ordered £3 million worth of hand-held portable terminals from Reading-based MSI Data International for use by its customer service division. MSI has made 200,000 of the terminals over the last two years and IBM's are to be delivered over the next 12 months. They are designed for capturing data at source and then transmitting it over telephone lines to a computer.

AA network

THE Automobile Association has installed a £30,000 UK-designed data network supervisory system from Banbury-based Test-Net Data Products. The system, based on the recently-launched DS4 remote switching and monitoring alarm module, is at the AA's head office in Basingstoke.

Navy spares

MINISTRY OF Defence has ordered a CTL 8026 mini from Computer Technology for the Royal Navy to run a spares control system at Portsmouth Naval Base. The system will be supplied with three 80-Mbyte disc drives and a number of software packages, one of which presents information in the form of pie charts.

Quarterback-up

INDEPENDENT Computer Engineering has ordered more than £500,000 worth of streaming tape drives from Cipher Data Products to provide back-up for the Rodine Winchester disc drives it is selling into the microcomputer market. The tape drives are the Quarterback model, cartridge type.

System takes off

WARRINGTON-based MatBval, manufacturer of the world's first fully programmable ultrasonic flaw detection system, has won a \$1 million contract through its sister company Bix America to supply a turnkey system for Martin Marietta Aerospace to test the carbon fibre-based thrust reversing cowlings it makes for large passenger aeroplanes. MatBval has chosen a Hewlett-Packard HP45 mini and UK-made Unimation Puma 500 robot arm to work with its Micropulse ultrasonic tester.

Nuclear deal

COMPENSA's second nuclear industry customer for its plant design management system PDMS is British Nuclear Fuels. The first was Electricité de France.

Sperry Univac

IN our story "£5bn market for 16-bit micros by 1986" we may have given the impression that Sperry Univac had left the microcomputer market. The company, of course, remains very much in that field.

Unions hit back at IT Year

by Kevin Pearson

THE trade union movement fired off its first blast to the government's Information Technology Year with launch of a film entitled *New Technology, Whose Progress?*

The film's makers, Education Media, backed by the British Film Institute, describe it as "a challenge to the uncritical 'razamatazz' surrounding the microchip". Its launch is timed to coincide with IT Year.

It is highly critical of the view that new technology will "automatically" improve the way we live. The film is also opposed to the view that it is inevitable that the UK must enter the race for increased automation, and that this, by itself, will bring economic prosperity.

Trade unionists on the panel are concerned about the impact the microprocessor will have on employment. "They're eliminating human energy and human intelligence by machines," said Mike Cooley of TASS, "and the reason they do this is that they believe by reducing labour costs that will make their industries more efficient."

Harvey Shaiken, a consultant to the US Auto Workers' Union, took up the theme. He said that a report by the Society of Manufacturing Engineers in the US predicted that by 1985 robots would have replaced one job in every five in the US car industry. By 1990 the figure was likely to be one in every two.



BENN... "Cost borne by the taxpayer."

Increasing use of automation and computers is also a tool for increasing management's control over work, says the film.

The final, and possibly most serious criticism of new technology being put forward is that of the leisure society created by automation. "All this stuff about leisure, or increased education or whatever, is absolutely meaningless given the present way our society is organised," says June Stoddart

of the Equal Opportunities Commission. "There is no mechanism for distributing wealth other than through the wage, and if people are outside the wage structure they haven't got anything."

These views are the legitimate concern of trade unionists and of society at large. Tony Benn, the Labour MP points out in the film that the cost of increased automation which puts people out of work is borne by the taxpayer.

Computer diagnoses fraud

by Frank Rees

WIDESPREAD fraud has been uncovered in Australia by a government computer surveillance team. It has discovered that one out of every 30 doctors has been milking the National Health Fund on a regular basis.

The Fraud and Overservicing Detection System, FODS, says that some 900 doctors in Australia have been milking the health service of A\$100 million annually.

FODS, which has been in operation for about 18 months, has used a computer to sift through more than 80 million claims for medical benefits payments made by Australian doctors each year.

From the 1975 inception of a centralised National Health scheme called Medibank, a computer system was used to develop complete profiles of a doctor's practice and thus detect divergence from norms. The result of this monitoring was the identification of doctors involved in overservicing and fraud.

The computer has revealed that the most common areas of abuse are where medical practitioners padded consultation times, claimed for questionable house calls, exploited home visits, and undertook needless pathology tests and X-ray examinations.

At first, the Australian Medical Association expressed disbelief at the magnitude of FODS findings, but later publicly conceded the computer's accuracy, after its own economic and statistical experts had confirmed the original diagnosis of dishonesty.

The FODS analysis confirms what was asserted some years ago by computer industry sources in Australia, when the AMA and other doctors' groups strongly opposed the introduction of centralised health benefit schemes, that such opposition stemmed from doctrinaire considerations and from a fear that the use of the computer would expose and quantify the extent of fraud perpetrated by some doctors on health schemes.

Civil Service technology deal 'mainly micros'

by Kevin Pearson

THE draft new technology agreement between the government and the Civil Service unions will mainly affect micros rather than larger computerisation projects like the PAYE project.

After two years of talks, union negotiators have agreed to recommend that their executive committees accept proposals agreed with Cabinet representatives last week. But the two-year timescale on the agreement means that it will run out long before the larger projects are completed.

The deal is viewed as a breakthrough by both sides since the unions, represented by the Council for Civil Service Unions (CCSU), had held out the widespread introduction of microcomputers in the Civil Service pending an agreement.

In return they have gained a pledge that there will be no compulsory redundancies following the introduction of new technology.

The agreement will be voted on

by the full council of the CCSU, including all nine unions, on March 17. If accepted it will come into force on March 22 and will run for two years.

Some of the unions could vote against the deal, though if the largest unions, the Civil and Public Services Association (CPSA) and the Institution of Professional Civil Servants, accept it then the voting would probably reach the two-thirds majority required by the CCSU for ratification.

Both sides have had to give way for the negotiations to reach this state. The unions have conceded that they would not get a shorter working week. The Cabinet has agreed that any people who lose their jobs through new technology will be redeployed.

The definition of new technology used in the agreement concerns "new or modified computers or microprocessors controlled equipment used in the Civil Service which have different staffing requirements."

French flout register

by Jack Gee

FRANCE's National Commission for Information Technology and Individual Liberties (CNIL) reports that only 27,000 operators of computerised files out of over 200,000 now in use are obeying a law which ordered them to register by the end of 1981.

Senator Jacques Thyraud, president of the CNIL, revealed the massive failure to register files when he presented his Commission's annual report at the Council of Europe in Strasbourg.

The CNIL said it had encountered

problems in the protection of personal liberties during its investigations of files held by the police, and the Ministry of Justice.

Thyraud said he hoped the French parliament would soon ratify the Council of Europe's convention on databanks.

The CNIL president reported that, although the Socialist government had ordered the issue of computer-produced identity cards for French citizens to be stopped last summer, similar cards were still being manufactured for foreign residents.

NEWS BRIEF

CDC and Modcomp in software deal

SOFTWARE and technical consultancy from Control Data Corp is to be available to US minicomputer manufacturer Modcomp in a novel deal which gives CDC part-ownership of its partner.

The software and consultancy go with a new 32-bit processor being manufactured by Modcomp under licence from Control Data. The payment is 90,000 shares in the Florida-based company, about 2% of its equity.

Shugart for Lille

US DISC maker Shugart Associates is to manufacture its SA801 8-in floppy disc drives at Rank Xerox's factory in Lille, France. Production is due to start by mid-1982. Other disc products will be made there later this year.

Ada release

TWO new Ada compilers have been released in the US by Western Digital Corp. MicroAda is an introductory compiler based on a subset of Ada, aimed at software development. Programs written in MicroAda can later be recompiled using the second more powerful compiler, which is being submitted to the US Department of Defence in the hope that it will be adopted as the industry standard.

Scottish training

ELECTRONICS training in Scotland must be increased if the demand for skilled manpower at all levels is to be met, according to a written statement from the Secretary of State for Scotland. It adds that steps have already been taken to increase the supply through greater spending on degree and diploma courses in electronics engineering, setting up information technology centres, and providing short courses for technicians.

CGS ready to market Multitel videotex

by Jack Gee

AFTER five years of research involving some £2 million, France's CAP-Gemini-Sogefi is ready to market its Multitel videotex system.

Jean Claude Guillet, director for new technologies at CAP-Gemini-Sogefi, said the company hoped to sell several hundred units of the videotex system by 1985 at prices ranging from 500,000 to two million francs (£59,000 to £200,000).

CGS has invested 10 million francs of its own funds in the project, with an equal sum from the French Telecommunications Authority.

The product comprises four systems: Multitel 10 (an autonomous control system), Multitel 20 (which provides access to a videotex and computer system), Multitel 30 (control system) and Multitel 40, which is an extension of Multitel 30.

Guillet said the purpose was to offer clients possibility of access to

a videotex system which would not impair the structure of their existing computer equipment, leaving them free to associate other equipment without risk of incompatibility.

Multitel operates on CII-Honeywell Bull's Mini-6, Inter-technique's Realité 2000 and IBM.

But CGS foresees competition from rival French manufacturer Steria, which has already sold 75 units of its Videopac videotex package system in Italy, Brazil, the US, Greece, and France over the past year.

Steria's launching effort was aided by the entry into service of the French Telecom videotex pilot ventures at Velizy in the Paris suburbs. The company's control equipment is being used for a test covering 2,500 homes.

Steria plans to sell several hundred videotex control systems a year with 70% bound for the export market.



CHRISTOU... MAI's dealers will be fully supported.

ICL wins micro deal from IBM

by Donald Kennett

KENNING Motor Group, for 10 years an IBM user, has ordered £300,000 worth of ICL DRS-20 microcomputers. They will be used by receptionists in its 60 main car and van hire depots from Aberdeen to Dover, to handle reservations and prepare documentation such as rental agreements.

Each keyboard will have a credit card reader attached and each night the IBM mainframe at Kenning's head office in Chesterfield will call up all the DRS-20s over the public telephone network, first to collect data on the day's transactions and later on to update local files on vehicle movements and availability.

Kenning's aim is to increase the utilisation of its hire fleets, as well as to improve the level of service to customers.

ICL won the order in competition with NCR, Datapoint, and IBM. It launched the first three models of its DRS-20 range last October to replace the ICL 1500, to provide local networking capabilities at 1.5-Mbps and to provide connections to IBM mainframes under several terminal emulations.

30-checkout PoS system

by Donald Kennett

THE UK's largest supermarket bar code scanning operation, with 30 checkout lanes, is to go live in August at Portsea Island Co-op in Hampshire.

It will be based on NCR 1255 point of sale terminals installed in 1980 for use with just the keyboard connected to the T-8250 central processor.

Using the slot scanners through which the bar-coded goods pass will enable the Havant Hypermarket, the branch of the Co-op in which the system will operate, to provide customers with fully itemised receipts, listing brand, size and price.

The Hypermarket expects to gain increased sales information, increased throughput per checkout and, to save on the cost of price-marking, 40 million individual items a year.

Dealer network set up for business range

by Philip Hunter

A BIG sales drive has been launched in the UK to coincide with the release here of a new 8-bit personal computer by US manufacturer Management Assistance Inc, MAI.

A dealer network is being set up to promote MAI's range of Basic Four business systems, which have already been successful in the US.

The new micro has been added to MAI's product line following its takeover of US dealer and systems house RCO, which developed the machine. It will fit in at the bottom of the Basic Four range, but will also be offered either as a personal computer running CP/M software, or as an intelligent terminal connected to a larger Basic Four computer.

It will cost £5,000, half the price of the MAI 80, which will be the next up in the range.

MAI has also announced a new member in the middle of its Basic Four range: the 310, which costs £13,000.

It will run up to 16 virtual display terminals and memory up to 256 Kbytes with disc capacity up to 120 Mbytes. It fills a gap in the Basic Four range, which at present starts with the MAI 80 for under £10,000, continues with the 210, then the 510, the 610 and finally the 730, which sells for about £80,000.

All members of the range run on an operating system with upward compatibility.

MAI's UK dealer network has been set up on a basis of vertical market type, and will sell all MAI hardware, with a range of new applications software packages.

"The dealer will in future receive the same support as one of our own branch operations," claims MAI's UK dealer, Peter Christou.

One of MAI's new software products is MBBS, an integrated business system, which runs on the current bottom range MAI 80, and costs £1,000.

It consists of a suite of independent modules for the usual ledger, order processing and payroll applications.

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Petnet low-cost modems to ease user access

by Donald Kennett

TWO low-cost modems are to be developed specially for Commodore's Petnet, a remote software and message network which is set to be the UK's first fully commercial bulletin board and telesoftware publishing service.

Tangerine Computers, makers of the best-selling Taniel range of viewdata adapters, will make the modems.

Petnet is currently running trials with about a dozen users on the ADP Network Services bureau. It is due to go live later this year when Commodore has decided on billing arrangements and assessed the market.

The Petnet service is similar to a viewdata service in that it holds pages of text in a hierarchical tree structure, with movement through the tree being made by choosing from a menu of up to 23 items on a directory page, or by backtracking up the tree.

Pages can also be accessed directly, if you know their numbers, instead of working through the directory. But one of the differences from viewdata is that the pages are numbered in the order that they are put on the system, irrespective of their position in the hierarchy.

This means that users control the growth of the database and it can grow indefinitely in any direction. Shortcuts through very long

chains can be set up by telling users to go directly to a numbered page from any point in the hierarchy, rather than by multiple-stage menu selection which provides only one route to each page.

Another difference from viewdata is that program listings need not be split into pages. Another is that page or listing charges can go up to £999.99, rather than 50 pence as on Prestel.

Education will be a major target market. Green thinks there is a need for hundreds of simulation programs in each of the sciences. Petnet will aid their rapid development, improvement and circulation, he believes.

The new modems will both operate at the viewdata-compatible speeds, receiving data at 1,200 bits-per-second and sending at 75 bps. But they will also be able to send at 1,200 bps and have auto-answer capabilities as well as the normal auto-dial.

Tangerine technical director Dr Paul Johnson said that his development department has more work than it can handle, but he is keen to push the project in order to maintain market leadership.

Petnet designer Nick Green said he wanted the 1,200 bps half-duplex facility because it was important to make it as easy to upload pagefuls of data from a software author's micro as to download it to the purchaser's.



Marketing director John Taylor, Tony Ebel and sales rep Michael Dick of Quest at CAD system launch.

All set to galvanise CAD market

by David Craver

A LOW-COST computer-aided design system which its makers hope will stir up the depressed UK CAD market has been released by UK manufacturer Quest Automation.

The product, Q-design, is aimed primarily at the first-time user who has been unwilling or unable to make the necessary investment in a sophisticated turnkey system.

The UK is not making the necessary investment in CAD, says managing director Tony Ebel, who adds that 90% of the systems Quest sold last year were exported. Ebel welcomes CAD awareness schemes being announced by

Technology Minister Ken Baker (see page 5), and says that company budget restraints have meant that investment predictions of 15 months ago have not materialised.

Quest's own budget picture has been muddled of late, with unexpected first-half losses announced recently and no upturn expected until next year. The company says, however, that it is looking to the long term, and has raised substantial funds through a rights issue and a loan and share options deal with British Technology Group.

The new Q-design system is for printed circuit board applications, but products for mechanical design, including architecture, civil

engineering, and pipeline design, are on their way. Cost for a standard system is under £25,000, which provides a graphic workstation with two interchangeable worktables.

One workstation has a 14-inch, high resolution colour graphics display with digitising table, while the second has a control display and keyboard for system messages. Position of the worksurfaces is power adjustable both vertically and horizontally.

The system is based on the Quest 1600 minicomputer with half a megabyte of memory and from 10 to 96 megabytes of hard disc.

Praise and blame for French consultants

by Jack Gee

THE French Government is mixing praise with criticism for its computer service and consultancy firms whose 38,000 staff are producing a turnover of FF800 billion (£1 billion) a year.

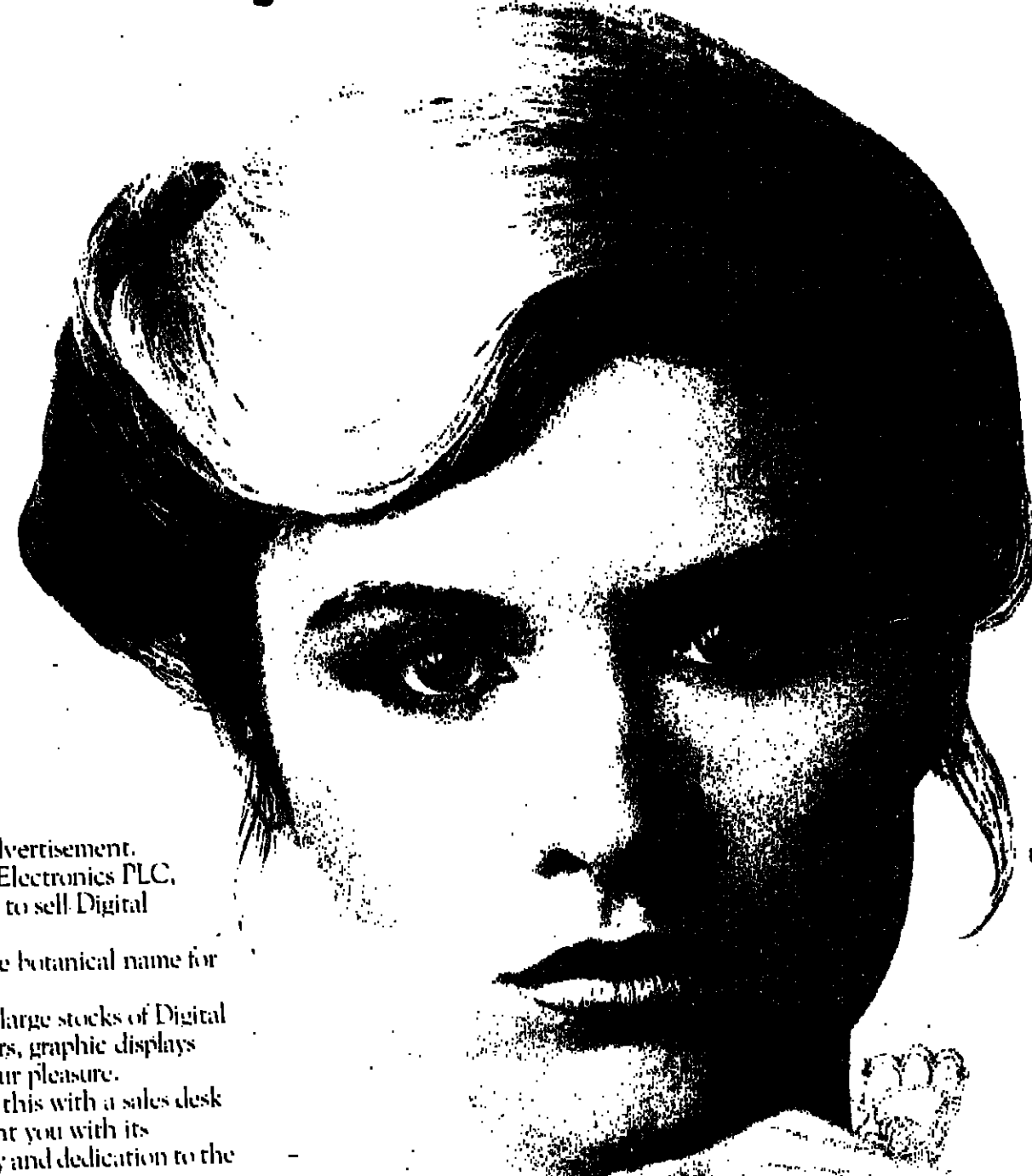
Robert Lyon, head of Prime Minister Pierre Mauroy's personal office, told a meeting of State Informatic, which groups two-thirds of these firms: "You are marking up exceptional performance. You have won your spot by entering Codis." Codis is the French Government's investment venture in advanced technologies.

But the government has also been criticising France's computer services and consultancy firms for providing temporary jobs rather than full-time employment. Temp work is currently the target of the Mauroy administration.

The computer service organisations have also suffered from a poor national image among their clientele and are now trying to promote themselves as an all-French patriotic industry.

Computer service firms in France now earn 12% of their turnover from systems engineering, 39% from intellectual assistance, 38% from lending equipment, 4% from keying in data, 4% from management and 3% from other sources. A group of ten companies accounts for almost 5% of the industry's total turnover.

The Lady Henrietta Foxglove.



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Main competition Men's teams Women's teams
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Computatug Men's teams Women's teams

Name of team(s)
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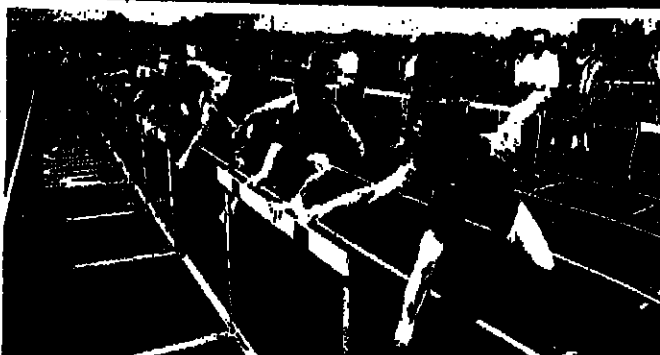
Enclosed is £..... to cover the entry fees for the team(s). Cheques should be made payable to Computastars Ltd.

In all matters relating to the rules or conditions of entry, the decision of the organisers is final.

Please send entry form and fees to Computastars, 117b High Street, Croydon CR0 1QG.
Telephone 01-688 6690

Dates and venues: Crawley, Saturday, May 15. Enfield, Sunday, May 23. Barnsley, Sunday, June 13.
Birmingham, Saturday, June 26. UK finals: Birmingham, Saturday, July 24.

If you have a query on Computastars please get in touch with the organiser at 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690



Events may not turn out exactly as expected — this is last year's relay race.

Still a chance to star at the DP Olympics

by Andrew Thomas

THERE'S still time to enter this year's DP Olympics, Computastars. The first UK heat will be for the South, and will be held at Crawley on May 15. The London area gets its chance at Enfield on May 23, the North on June 13 at Barnsley, and the Midlands at Birmingham on June 26.

The UK finals will be held at Birmingham on Saturday, July 24, with the European final taking place in Belgium later in the year.

Computastars is a team and individual competition for DP people which calls for athletic skills on field and track, in general sports and in the gymnasium. Events can range from long jump and discus to the fearsome steepchase, but part of the attraction of Computastars is that competitors don't know what's coming until they arrive at the venue.

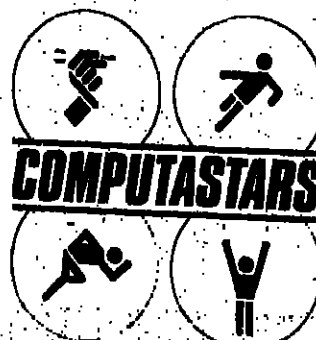
Entries are open to men's and

women's teams of between three and five, and any number of teams can enter from a single user or supplier company. Only personnel who are fully costed to data processing activities are eligible for entry, and each team must nominate "Number One" who will compete in all events for the individual title.

For the first time, there are special categories for small firms employing fewer than 25 staff within a radius of 25 miles, and veterans, who must be over 35 on February 1 this year. These classes are being run this year for men only.

The team captain must select three members to compete in each event, one of which must be the Number One.

Run alongside the main competition is Computatug, the tug-of-war contest, open to teams of five men or women who are not already competing in Computastars.



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NEWS BRIEF

Irish modems firm launched

THREE former employees of Electron have launched Cornell Electronics to manufacture modems and related products. Their aim is to establish in Ireland a total data communications service to the Irish market and to build up exports based on locally-produced products.

TV trial

GRANADA Television Rentals is to start a trial with 10 NCR 2950 point-of-sale terminals in April that could result in 500, costing about £2 million, being installed next year. The trial follows a one-year study of point-of-sale systems with which Granada could replace the cash registers in all its UK showrooms.

Central monitor

BLACKHEATH-based systems house Brown's Operating Systems Services has enhanced the viewdata terminal support facility on its IBM-compatible cluster controller to enable the entries being made through up to seven terminals on the controller to be monitored from the central site. This means that a salesman at the central site could help customers to enter their orders, or the system could locate faults quicker.

Siemens US deal

SIEMENS has signed an agreement with Xerox in the US to market its Ethernet high-speed coaxial cable based local network and its System 8000 integrated text and graphics workstation in West Germany, Switzerland and Austria. Office information systems accounted for about 20% of Siemens' communications-related sales last year.



LIARDET... Optimiser grew out of a Digits product.

Linear programming comes to micro users

by Claire Gooding

A COMPANY'S promise to set new standards in microcomputer software was put to the test this week when Caxton Software Publishing released its first product.

The program, called Optimiser, is a tool for making the best use of resources. Users can use a microcomputer to juggle around the various ingredients of a problem, be it the making of beer or the allocation of an advertising budget, to reach the most efficient cost-effective solution.

The technique, known as linear programming, has long been used in large-scale production, but Caxton's aim is to make it available to micro users as a management aid. The package costs £295 for the Apple computer, about £2,000 for the entire system, and there are

plans to release Optimiser for the CP/M operating system before long.

Although Caxton is aiming first at existing users of linear programming by offering a cheap alternative to time sharing, it expects to interest new users as well.

When Caxton was formed last year by Alan Wood of Digits, Bill Barrow of Data Logic, and David Tebbutt, one-time editor of Personal Computer World, the emphasis was on making things easy for the end user.

The firm saw itself as a sort of talent scout for British software, providing the services of packaging, professional marketing and distribution to the programmer who had ideas, but not the resources to sell them. When formed last October there was no product

line to prove the point.

The documentation supplied with Optimiser is certainly thorough. "The tutorial level for the real beginners holds the user's hand - very tightly," explained Tebbutt.

"It will even tell him things like... the disc drive will whirr and click... so that he's sure of being on the right track."

Author of Optimiser is Digits programmer Mike Liardet, who stands to gain glory rather than royalties because Optimiser grew out of a Digits product.

"The linear programming algorithm was a fairly small part of the programming effort," he said. "Trapping user errors and providing the user interface were far more significant in terms of development work."

Fujitsu in attack on US rivals

by Kevin Cahill

FACED with growing American criticism of Japanese computer companies, Fujitsu president Takuma Yamamoto has launched a strong attack on two of America's technology giants, IBM and American Telephone & Telegraph.

In an interview with the Japan Times, Yamamoto said that competition with IBM, which dominates the world computer market, "was as big an issue as governmental trade control."

He claimed that despite IBM's position, some of Fujitsu's computer technologies are more advanced than IBM's.

"In some areas of both hardware and software Fujitsu was the first to market new products, and IBM followed us," he said.

Fujitsu has been locked in battle with IBM in Japan for over 20 years and has only recently pushed IBM into the No 2 slot there.

Yamamoto says that to narrow the gap with IBM, Fujitsu often has to sacrifice its own brand name. "Nearly 90% of Fujitsu's computers are to be exported for sale under the name of foreign companies," he said.

Turning to AT&T, which recently rejected a bid by Fujitsu to supply fibre optic cable for the new light wave communications system linking New York and Boston, Yamamoto said that the company apparently made a mistake in inviting foreign companies to tender.

AT&T turned down the Fujitsu tender in favour of a more expensive quote from one of its own subsidiaries.

AT&T is alleged to have claimed that Fujitsu was putting in an underpriced bid to get the business, a claim which according to Yamamoto, "damaged Fujitsu's reputation and was totally unfounded."

GLC gives backing to IT Year

by Rory Johnston

COMMUNITY groups, clubs, and other voluntary organisations in London now have a chance to use microcomputers and word processors free following the setting up of a room in County Hall especially for the purpose.

Greater London Council has provided the room, with four micros and two word processors, as part of its contribution to the Information Technology Year. It is intended to keep the room going when IT Year is over.

To help the groups run the equipment, the GLC is looking for expert volunteers from the industry to come forward, since the Council cannot provide any staff. A group wishing to run a mailing list for newsletters or publicity will be able to keep the list on one of the word processors. The micro can be used for accounts, databases, and the like.

David Perry, of the GLC DE department, says one computer professional who has a particular interest in wildlife has already made himself available. Volunteers for other fields are being sought, which would probably involve assistance in the evenings.

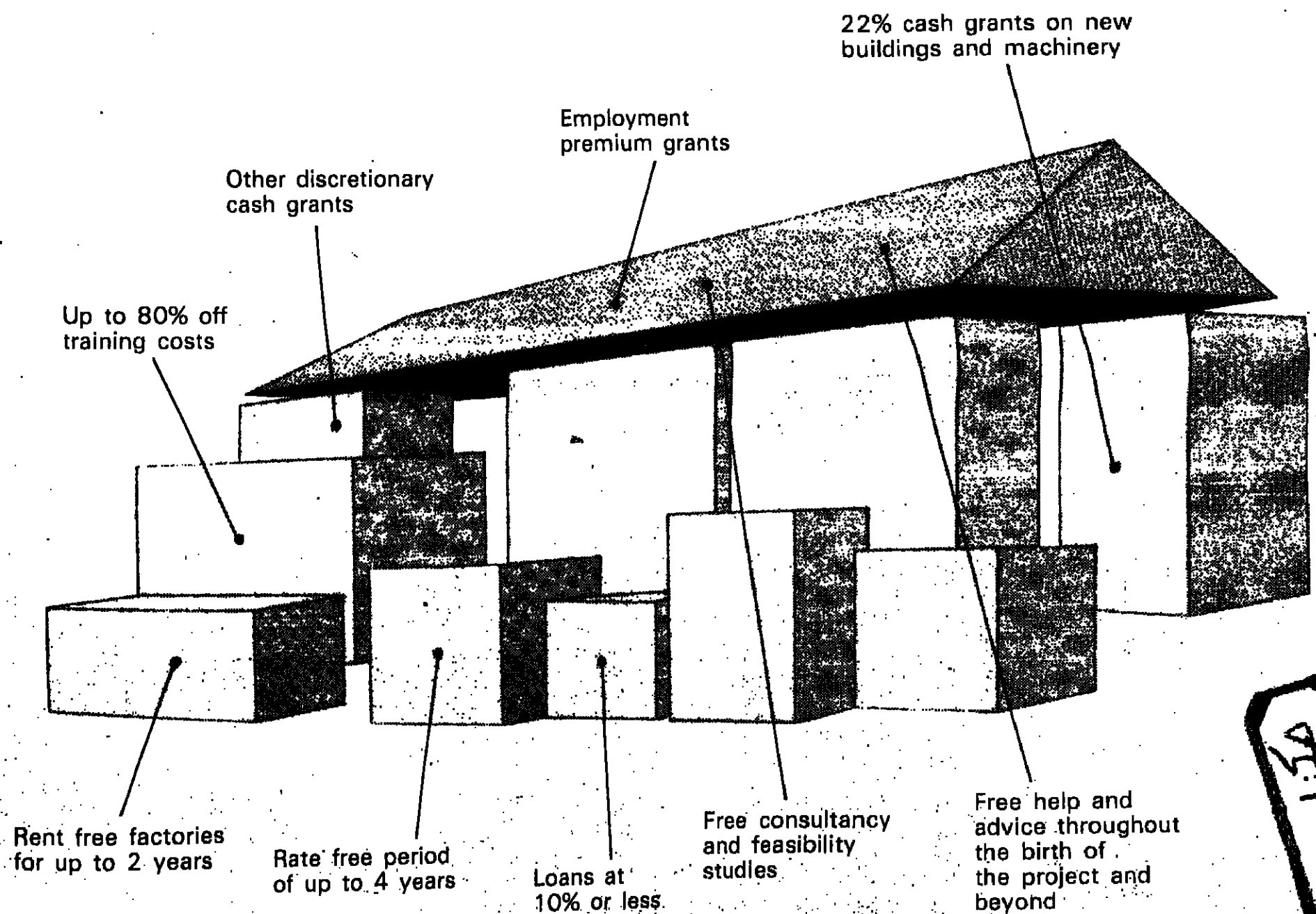
Almost any voluntary group, including trade unions, will be able to use the facilities, but not political parties or commercial organisations. Manufacturers can lend equipment to the room and in return will be able to use it for demonstrating to prospective customers.

At the moment the equipment consists of Wordplex and IBM word processors, a Pet, an Apple, some Acorns, a Prestel set, and terminals to the GLC's mainframes.

One organisation that has already expressed an interest in using the facilities is the Rape Crisis Centre, says Perry. Any other, and interested volunteer experts, should contact his department on 01-633 3348.

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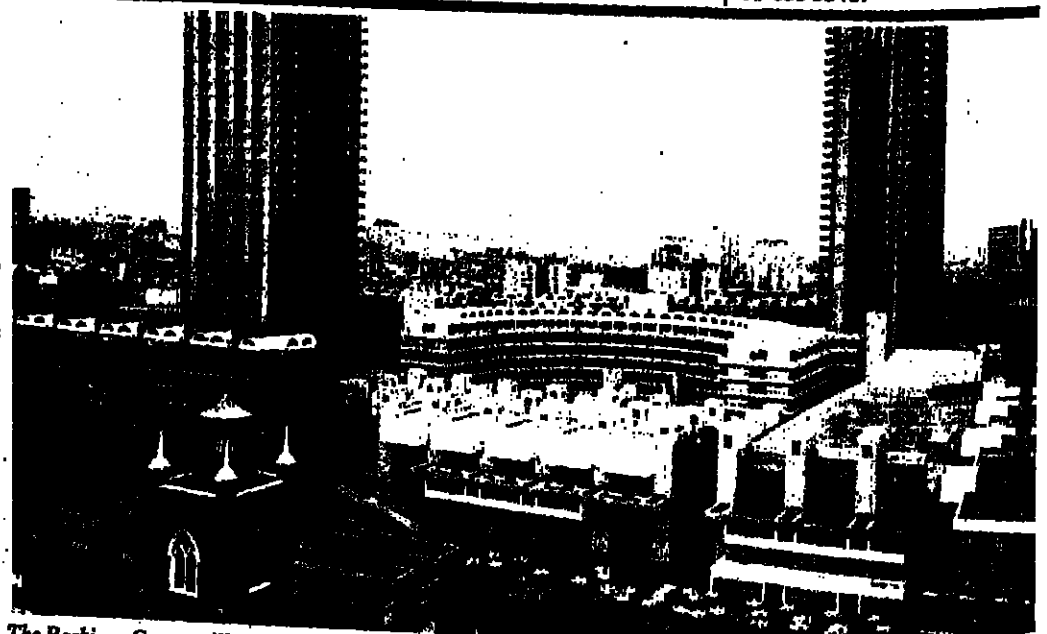
Micro800/2 is a powerful, flexible, and easy-to-use microcomputer system. It features a high-speed central processing unit, a large memory capacity, and a variety of expansion options. It is designed to meet the needs of a wide range of applications, from data processing to scientific computing. The system is built on a solid foundation of reliability and performance, ensuring that your investment is protected for years to come.



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The Barbican Centre will use the BOCS reservation system to book 6,500 seats each day.

BOCS books in at Barbican Centre

by Kevin Cahill

BOCS beats Boris at the Barbican. No, not a new kind of wrestling, but the name of the two software packages which were tendered to provide the £140 million Barbican Centre in London with its real time box office reservation system.

BOCS, a DEC-based system supplied by Space Time Systems, emerged as the winner this week when the Common Council for the

City of London turned down the ICL offering, Boris.

According to Angus Watson, head of publicity at the long-awaited arts complex, the system will be installed in time for the Barbican Centre's opening this week.

When the booking office opens with over 6,500 seats to sell each day, the £200,000 BOCS, which is based on a DEC PDP-11/44, will

be able to take reservations from each of 16 terminals scattered throughout the centre.

At the same time, Space Time Systems have announced that BOCS will be installed in Cardiff to take bookings for the St David's Hall Welsh National Conference and Concert Centre, and in Warrington to handle the bookings for the new Spectrum Leisure Centre there.

Hasler takes telex device to PTTs

by Donald Kenner

THE UK subsidiary of the Swiss data communications company Hasler is going after French, Dutch and Belgian PTT approval for its recently launched word processor-to-telex converter, claimed to be the first of its kind.

The device is already approved

for attachment to the UK telex network. BT Gold, the new independent company set up to market the Dialcom electronic mail service on behalf of British Telecom, has bought three for its connections to the telex network.

Product manager Paul Caw-

home said 30 of the devices had

now been supplied and orders had been received for 300.

Software to enable the Inter-

Superba mini-computer to use it has been approved by BT, and Hasler is preparing to submit software for the Apple and Pet.

The prices are from £1,200 each for one to £650 each for 25.

Optical modems take off

FIBRE optic data links for microcomputer systems are beginning to take off, with people now buying equipment to build into products.

Gavin Dyer, sales manager of Systems Production of Farnborough, Hampshire, aims to increase shipment of fibre optic modems and multiplexers, currently in the high hundreds, three or four times this year.

"Fibre optics are now moving from the embryo stage into products," commented Dyer. "We will definitely sell equipment as a result of the show."

SPL's first military order for optical modems to be embedded into VDU's has been received. The VDUs will be used in applications requiring high performance in rugged environments while maintaining data security.

On the industrial front Versatec, California-based plotter manufacturer, has ordered £20,000 worth of fibre optic modems to install in a range of high-speed remote plotters. The optical links were chosen to cure data corruption problems.



DYER... Increasing shipments.



ATKINSON and PORZAK... Tanays is one of three UK distributors signed by Vector.

Packaged software boost for UK

MOVING into the UK with a big push in packaged software products, Vector International, the Belgian-based European representative of Digital Research, has signed up three British distributors.

At the same time, Digital Research has announced in California that it will be working closely with Intel to develop a multi-tasking multi-user operating system for the new iAPX 286 16-bit processor. MP/M-286 will support the full memory protection and management and the virtual memory facilities the chip offers.

Intel will supply prototype hardware for Digital Research to work on, meaning that the operating system may appear at roughly the same time as the chips do in any number. Sixteen-bit languages and applications running under MP/M-86 and CP/M-86 and 8-bit CP/M packages would then provide a software base for using the device.

Tanays in Windsor will distribute the whole range of Digital Research products in the UK.

led by the standard operating system for 8-bit micros, CP/M, and its derivatives - says David Atkinson, Tanays' software marketing manager.

Xitan Systems of Southampton will also carry the full range, but the Legal Connection of Fareham, Hampshire, will only handle CP/M-86 and languages for the 16-bit 8086-based IBM Displaywriter.

Jim Porzak, Vector's standard software division director, says that Vector itself will be setting up in Tunbridge Wells in April. It will supply market support to the distributors and UK OEMs and hold local stock of the software products.

"The big push will be on CP/M-86 for the Displaywriter," says Porzak, who hopes CP/M-86's availability will encourage software people to move to 16-bit systems.

The Displaywriter, IBM's major entry into the word processor market, has all the features of a general-purpose microcomputer except a general purpose operating system, according to Vector. The

CP/M-86 implementation will open up a wide variety of application software to Displaywriter users.

Vector's main European activity for the next six months will centre around the Digital Research languages, CBasic, CBASIC, PL/1-80 and Pascal/MT.

Availability and support will be pushed, and documentation translated into various languages, which will help UK OEMs to sell in Europe, Porzak says.

A 16-bit version of Pascal/MT will be launched in the US in mid March, and Porzak reckons Vector should have stock by the end of March. Other languages in 16-bit versions will follow by the middle of the year, he adds.

One strange facet of Vector's stand at Microsystems '82 was the presence of packaged software for DEC's VT180, the VT100 terminal with the option converting it to a CP/M microcomputer. "We are offering the four languages as packaged products, but we have no hardware to demonstrate them on," Porzak commented wistfully.

Integrated Micro Products was

Made-in-Britain 16-bit has Unix related system

A FORETASTE of this year's anticipated feast of new 16-bit microcomputers has come from three month old Integrated Micro Products.

Built in Britain around the Motorola 68000 processor, the machine has 256K of RAM, an 8-inch thin line floppy drive and a 54-inch Winchester disc as standard. Idris, the Unix-related operating system from White-Smiths, is included in the basic system, with Pascal and C compilers.

A pre-production prototype of the IMP-68 was on show at the Microsystems '82 exhibition in West London last week. It attracted a gratifying amount of interest for the new Tyneside company, which is looking for finance as well as custom for its first product.

Microsystems is Computer Weekly's show for technical and industrial microcomputer users and for systems builders. It is intended for visitors who want to buy components and peripherals to build into systems, who build or use microsystems in process control and product applications, or who use microcomputers for technical jobs like design engineering.

Attended by senior engineers and management research development engineers, software specialists, directors and the like - the show has been running since 1978. This year at the West Centre Hotel it has concentrated on these technical areas, but has been notable for the software houses it attracted.

Integrated Micro Products was

set up three months ago, after Joe Dawson and Alan Cleary, partners in Real Time Systems, the European distributor of White-Smiths' US software products, were approached by Mark D'Amico and Dave Liddell of Riscoun Electronics.

Anson and Liddell had a 68000-based S-100 bus card and, looking to put a Unix-type operating system on it, went to Real Time Systems. Dawson and Cleary wanted to build hardware, so the company was formed. Within three months the system was boxed - in a case styled by a brought-in industrial designer - with Idris up and running.

"You've got to move fast once you get going," comments Dawson. The main problems encountered were with the Internet handling, but these are now solved, he adds.

He sees the main market for the machine being OEMs and people wanting to develop application software for the 68000. Some application software, cross compilers and assemblers for microprocessor development, are already available from Real Time Systems, and word processing software is on its way from one of its customers.

This will initially be written for an LSI-11 system, but because of the ease of transportability at Idris affords it should not require much effort to move onto the IMP-68, according to Dawson.

System software support will be supplied by Real Time Systems, which is closely linked with Integrated Micro Products. Dawson and Cleary are both partners in RTS and directors of IMP.

3D snaps up school project micro

THE tale of successful microcomputers that started out as a development project by two men in a garage is a potent one. The success of companies such as Apple has tempted many into the microcomputer jungle.

Now, from London-based 3D Digital Design and Development, comes an 8-bit microcomputer that started out as a school project from three Sevenoaks sixth formers.

At an exhibition two years ago, 3D's directors Alan Mills and Kahlan Kibasi were approached by the schoolboys with a 6809-based board they had built as a prototype system to help with their software writing.

It was running high resolution graphics and space invader programs, and they wanted to develop it further.

The result of this development is the 3D09 system which was shown in public for the first time at this year's Microsystems exhibition.

The 6809 machine, with 64K RAM and a controller to run four floppy drives of any type, according to Mills, is aimed primarily at the scientific and technical market. It costs £2,800 with twin floppies giving 2 Mbytes of storage.

"There are any number of computers around in the commercial area, and lots of dealers with experience in fast and furious competition," says Mills. "Our machine will serve as a commercial system, but the main thrust, at least to begin with, will be the technical line."

This reflects the nature of 3D's main business since it was set up four years ago. It places most emphasis on interfaces for IBM 488 bus systems, having started out with a printer interface board for the early Pops, before Commodore itself provided one.

"We saw a hole in the market for Pet printers, and were then approached for a whole range of products on the 488 bus. We expanded from there, getting into system work, commissioning and installing systems, and writing software, but staying in the technical area."

He sees the operating system 3D offers for the 3D09, Pops, and the machine's multi-tasking capability as powerful features. An IBM 488

interface card will be available soon, and then the machine will only lack colour and hard disc, Mills says.

The system can run a couple of remote terminals, for remote data entry and interrogation of the system, but true multi-user operation will have to wait until the Unixflex operating system, a blend of Unix and Flex, is implemented. Mills says 3D will be looking at this at the end of the year.

He claims that the memory boards, which run at 2 MHz with no wait states through the design of the refresh circuitry, are faster than most Z80 systems.

He also says that the best of the Basic interpreters 3D can supply, a pre-compiler giving intermediate code, is very fast. He reckons it is about 11 times faster than a Pet system.

William Morel, one of the three sixth formers, agrees that it is "quite an improvement" over his original prototype, built with his teacher to encourage his out-of-hours programming.



MILLS... Aiming at scientists.

MICRO NEWS Inmos 'undecided' on methods of financing

WHILE the UK factory of Britain's government-backed chip company Inmos takes high tech shape in Wales, continuing speculation surrounds its future investment plans.

Reports abound of plans to raise capital from private or government sources, and to build new plants in Britain, or Japan, or the US, but Inmos itself is not giving much away.

The official line is that Inmos will be looking for external finance to grow, and make the most of its opportunities. This has always been the intention of Inmos and the National Enterprise Board (now the British Technology Group) that put up £50 million to set up the operation.

But the method and timing of such finance has not been decided, Inmos says, adding that it would not wish to exclude from its thinking any particular source of finance.

This is backed up by Mike Wright, director of Inmos' UK operations division. "We are

within our finance, and capable of supporting our manufacturing operation. But every semiconductor manufacturer needs more investment."

Inmos' ability to attract private money will depend on whether it can convince potential investors that the company will be a successful force in the market. While some observers believe prospects are not good, Inmos seems sure of its chances of success.

With the products already in production in the US factory, turnover has passed \$1 million a month and is rapidly growing. Bookings are running well and several contracts worth over \$1 million have been signed.

Inmos claims significant market penetration in the obvious market for 16K static RAMs - for building into computers - including good customers in Japan.

It estimates it between 60% and 80% of the market for fast 16K statics with speeds below 70 nanoseconds.

Digital to release T-11 as single chip

DIGITAL Equipment's chip level PDP-11 microprocessor the T-11, is to be available as a single chip from April. The device has only been sold on the Falcon single board computer since its launch last November.

The T-11 is a 16-bit processor running a basic PDP-11 instruction set, compatible with the range of LSI-11 boards and PDP-11 minicomputers. It can have a 16-bit or 8-bit data bus, user-selectable for performance (16-bits) or lower cost (eight bits).

Five micron technology puts 13,000 transistors on a die five millimetres square. The number of transistors was minimised to give the small die size at a low cost.

The move from DEC's six micron technology, used in the LSI-11/23 two-chip set, involved considerable redesign, giving an increase in circuit density of 30%, about twice what would be achieved by a simple linear shrink.

The T-11's smaller scale circuitry makes it operate faster while saving 20% of the power needed. Running off a 7.5 MHz clock, its execution speed is roughly the same as a PDP-11/34, and twice that of a PDP-11/05. It runs faster than the two-chip LSI-11/23, and draws less than 0.8 Watts.

Like the Falcon board, the T-11 chip is aimed at control applications, ones using "buried intelli-

gence" - with processors built into equipment for process control, for example - according to Edgar Valentine, DEC's LSI marketing manager.

"The intention is not to compete with other products, rather to offer a downward migration path to established DEC users," he says.

Valentine does not see the device competing directly with specific chips from other manufacturers either. It will add to the spectrum of eight and 16-bit devices available to designers, he says.

A great advantage for the processor, in his view, is the ease of transferring expertise in developing application programs gained from work with VAX-11, PDP-11 and LSI-11 systems.

The device will be available in sample quantities from April, with volume following in the summer. Rather than offering just sample chips, DEC will be producing a "starter kit", containing a small number of T-11 chips, documentation, software and tools needed to get acquainted with the microprocessor.

The kit will sell for several thousand pounds, Valentine reckons. Unlike the kits, which will be sold through distributors, the chips will only be available direct from DEC, at below £100 in OEM quantities.

Intel makes higher performance promise

HIGHER performance for processors and memory devices is on its way from Intel.

An 8 MHz version of the 8088, Intel's externally 8-bit but internally 16-bit microprocessor, has been introduced, a 60% performance advantage over the 5 MHz standard part.

Our HMOS-II technology enables the 8088-2 to achieve the highest performance available from any 8-bit microprocessor," claims Jeff Miller, marketing manager of Intel's microprocessor component operation.

But HMOS-II (high performance metal oxide semiconductor), developed in 1979 from Intel's proprietary HMOS process, is now the highest technology for its memory and microprocessor devices.

A third generation, HMOS-III, will improve circuit density and performance. The gate delay for HMOS-III is half that for HMOS-II, at 200 picoseconds.

It has two micron design rules, and is the first Intel HMOS technology to use wafer stepping lithography and dry etching to attain the required tolerances.

Existing components can be directly shrunk to be manufactured in the new process, giving better density and performance without redesign. This means customers do not have to cope with changes other than the increased speed.

The part has a 15 nanosecond access time, compared to 45 nanoseconds for the HMOS-II 2148 and 70 nanoseconds for the HMOS 2148.

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RAPPORT

Last week Kevin Cahill listed the goals of the Fifth Generation project. . . Here he describes how they are to be achieved

Human brain is the pattern for Japan's futuristic system

MUCH of Japan's industry is driven along lines which are laid down by agreement across government and private sectors. Computers are no exception, and the Fifth Generation project which has now been defined is remarkably candid about what is intended.

The driving force is to overcome the country's grave disadvantages - Japan has too many people, not enough food and raw materials, and an almost complete lack of indigenous energy.

These are the basic goals set out for fifth generation computer solution. A breed of systems is needed which combines natural language input with genuine VLSI (very large scale integration) technology.

The world is currently in the fourth generation of computers, little more than bigger and faster versions of the IBM 360 series, which characterised the third generation.

The Japanese intend that the fifth generation computer system will solve problems, and not, as many current systems tend to do, simply make problems go around faster.

The first step in orienting these systems towards true problem solving, according to the preliminary issued by the Japan Information Processing Development Centre, JIPDC, is to base the design on those social goals which could realistically find a technical solution.

This approach, though attractive in that it provides socially useful and therefore politically acceptable goals, has the disadvantage of not furnishing clear guidelines to project managers. To ensure that the end result was a unified system, and not a series of conflicting technologies each of which appeared capable of achieving the desired outcome, research objectives and functional goals were set up from the beginning.

The goals laid out for the research and development phase of the project, which is expected to last until 1984 for the basic technologies, are as follows:

"The fifth generation will have the following basic functions:

1. Problem solving and inference functions.

2. Knowledge base management function.

3. Intelligent interface function."

To achieve those three functions in one system, the report estimates that the hardware will have to operate at between 100 million and 1,000 million logical inferences per second. (According to the report, one logical inference using existing computer techniques would take between 100 and 1,000 machine instructions to execute.)

The idea of making a machine operate by means of logical inferences, as opposed to the current chain logic mode of conventional software, is extremely ambitious. It is an attempt to emulate the way in which the human brain itself appears to function, by rapidly making trial and error estimates, skipping across logical pathways which, if followed, would make human activity incredibly slow.

The system is consistently seen as an interaction of the three key areas identified above.

Interface between man and computer will approach the human level

The inferential functions are derived from the machine's ability to access a huge knowledge-based (as opposed to database) management system, which in a typical fifth generation machine will hold between 100 and 1,000 gigabytes of data. The inferential functions themselves are initiated by an interface system which will allow, for speech, graphics and natural language input.

In short, what the Japanese researchers will be looking for is an overall system to which you can address your problem in whatever your everyday language happens to be, and from which you can get, not the next step in the problem, but the complete solution. Fully programmed and resolved. They expect that the system will deliver

certain levels of solution in a matter of a few seconds.

A summary of what the research phase is expected to deliver is shown in Figure 2.

The fifth generation "will be oriented towards processing knowledge information and will have quite a high logic capability," the Japanese say. Its greatest feature will be that "interface between man and computer will approach the human level."

Describing current technology the report says that man-machine interface has taken place via procedural programming languages. To solve a problem with the help of a computer, man had first to describe, model and program the problem.

In many cases this has meant unpicking long established formulae and rewriting solution procedures which work well enough in their existing form.

The Japanese Fifth Generation project is an ambitious attempt to install a problem solving and definition procedure into the basic structure of the final machine.

The report states that the new machine system will use logic programming languages or problem solving languages for trial and error logical inferences.

"The Fifth Generation computer system will always utilise knowledge required in series processing, beginning with inputs such as speech, natural languages, pictures or images from the human system, and extending to understanding these inputs, synthesising and executing programs around them, and generating responses."

"These knowledge include a knowledge of languages, a knowledge about problem domains, and a knowledge about the mechanisms and data expression of the machine system, all stored in a knowledge base."

In terms of simple functioning, the project is intended to deliver computers which will be able to understand a problem description and from that description generate a model and synthesise a program based on the model.

To achieve this extraordinary goal the Japanese members of the

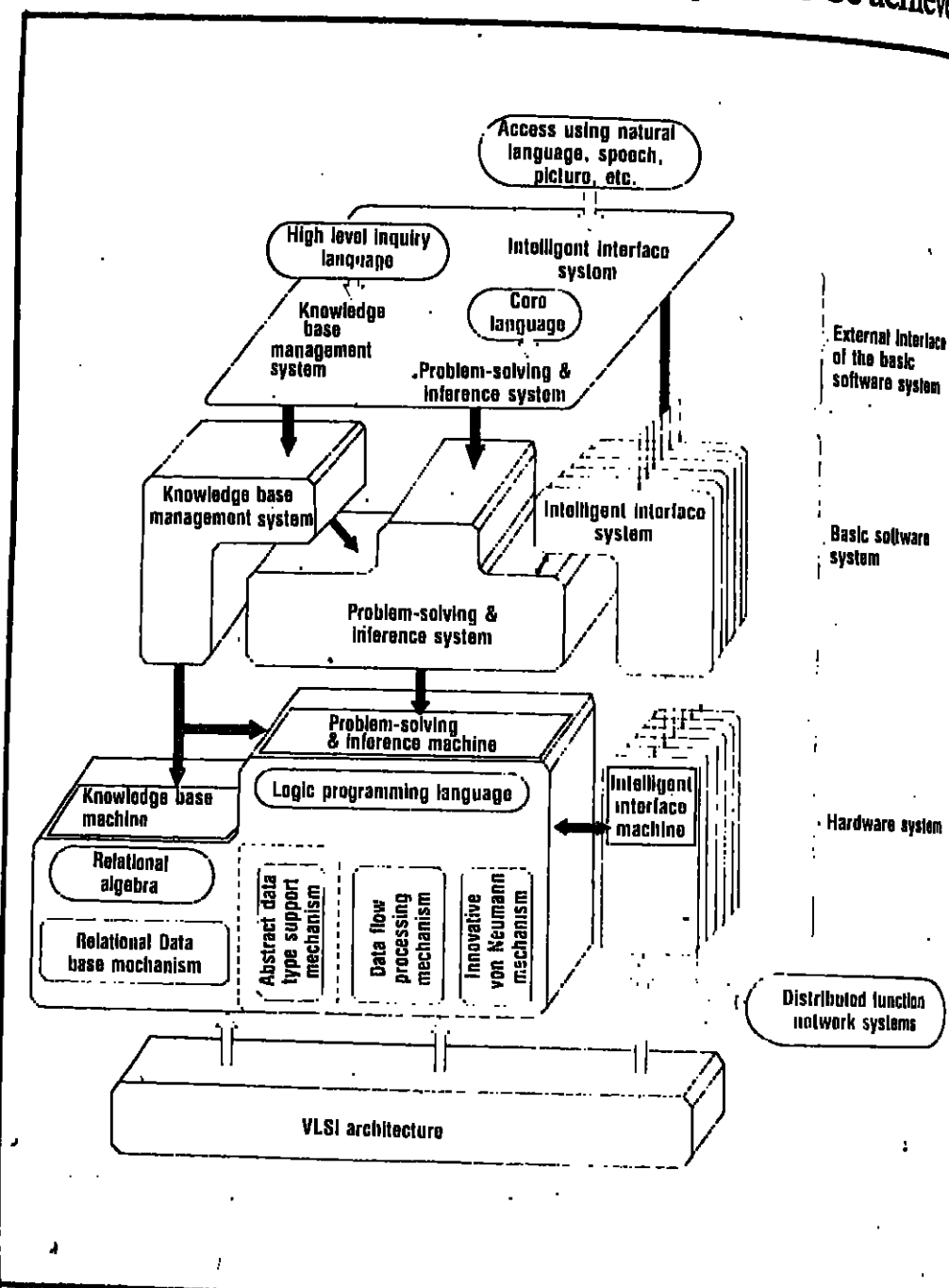


Figure 1. This diagram represents the current Japanese originated 'image' of what the Fifth Generation system will look like when it finally appears in 1991. Essentially it is not one single computer, or computer type, but a series of interconnected database and parallel processing machines front ended by an interface machine which can accept problem statements in a natural language.

team have already laid out a theoretical hardware configuration (shown in Figure).

Central to the machine processing procedures themselves are von Neumann techniques. These are currently used in a number of existing computer types, including the Cray series, and essentially involve the application of linear algebra to parallel processing functions.

"The hardware architectures shaping the functional components will be based on a combination of six machines. These are the six machines that are being studied as the likely candidates to establish the new architecture. The machines will be so combined by adopting the distributed function architecture, namely by applying the modularisation, adoption and microprogramming techniques."

The Japanese are not proposing a hardware revolution as such, neither are they stepping too far into the future

For the smaller computers of moderate performance, a firmware base architecture built on innovative von Neumann techniques will be adopted. In a vital comment on the initial operations of the smaller fifth generation machines, the report indicated that new languages will be invented.

"For the powerful large-scale systems, data flow machines including functional machines will serve as the core technology in their construction," it says.

The actual intended functioning of the fifth generation multiple CPU is spelled out as follows:

"For the problem solving and

inference computers the execution part in the logic programming machine will use a large-scale data flow mechanism for its execution and the knowledge base will be processed by a small-scale, high-speed relational algebra machine. [This] will use a suitable data flow mechanism for its execution."

The report then goes on to say that "a large-scale knowledge-based computer will use as its core a large-scale relational database machine including a relational algebra machine."

By so clearly emphasising the parallel processing and database type functions at the core of the new machine, the Japanese are not actually proposing a hardware revolution as such, neither are they stepping too far into the future, since they intend that the hardware itself - the memory chips and logic circuits - should be fully specified by the end of 1984.

Based on the current state of the art, that suggests a 10,000 gate logic circuit chip for the processing functions in the machine, and 256K or one-megabit dynamic RAMs with access times of around 50 to 100 nanoseconds. In fact, it suggests that the Fifth Generation is looking to the overall structure rather than the hardware, to provide the solutions.

For any machine to work in the manner in which it is intended that the Fifth Generation will work, the machines must have access to an unusually high level of information, uniquely structured.

In the global knowledge base which will service the system the JIPDC report has identified three sub-knowledge bases. These are: a general knowledge base similar to common sense, a systems knowledge related to systems, and which will gather together knowledge about certain applied fields.

The general knowledge base will

include: "bases of basic words in everyday use, basic sentence patterns and basic scripts, a base of dictionaries of various languages and sentence construction rules, and other bases related to natural languages."

The systems knowledge base will include: "bases containing specifications for the system itself, such as a processor specification description base, an operating system specification description base, a language manual base, a program module base containing programs which are highly usable, and other bases."

The system will take ten years to produce

The application knowledge base will include a VLSI design technology base, a computer architecture base, a basic program base, and other bases.

According to the latest report from the Japanese Ministry of International Trade and Industry, which is the co-ordinating body for the project, the Fifth Generation system will take ten years to produce.

The whole project will be in three phases, the first of which, the basic research into technologies, will commence this year and end in 1984. MITI plans to invest \$7 million in this initial phase.

The second phase, the development of the sub-systems, will begin in 1985 and end in 1988. The final phase, the development of the total systems, will start in 1989 and finish in 1991.

So far Britain, France and West Germany have accepted the Japanese offer of some participation in the project. One commercial company, Sperry Univac, has also indicated that it wants to be involved.

SOFTWARE FILE

Legal link-up pools databases in UK and US

POOLING of data between companies with similar interests may be given a boost by the international linking of legal databases.

Eurolex, the UK-based division of the International Thomson Organisation, has announced a link-up with Westlaw, the online legal research service of West Publishing Co in the US. This will give UK users access to full-text information about federal and state law in the US, as well as UK, EEC and other European law.

Many bureaux offer access to banks of numeric information built up by outside companies or organisations, often located in several countries. Geisac and SIA have international scientific databases, and I. P. Sharp is now offering clients access to economic information compiled by Business International in New York and the Organisation for Economic Co-operation and Development.

The Eurolex-Westlaw link will create a database containing 600 Mbytes of legal text and research material consisting of references and precedents. Eurolex is leasing space on IBM and Amdahl equipment owned by BOC Datasolve, which will also provide networking support. Pilot connections are now being set up for the transatlantic link via the International Packet Switching System.

Software for the project was developed by the Atomic Energy Research Establishment at Harwell, under advisors Norman Nunn-Price and Professor Bryan Niblett. It is a non-dedicated system, and will link up a telephone line to 30% of standard teletype equipment, according to Charles Arthur, marketing manager for Eurolex, so that customers will not need to invest much capital in specialised hardware.

"The beauty of this system is that it's British and it's competi-

tively priced," commented Arthur.

Eurolex users pay £45 per hour for access to the database, which is ostensibly less than clients of Lexis, the telepublishing arm of Butterworths, the legal publishers, which has a legal text database held in the US. Lexis charges £1.20 per minute, but claims that it works out cheaper because access is faster.

"We have gone to the expense of installing our own transatlantic machine cable, and customers dial into our multiplexer at Bell Yard," explained Kyle Bosworth, Lexis marketing manager. "You can read through 60,000 volumes of law reports searching for one word in four seconds at 9 a.m. The same search still only takes 12 seconds, later in the day when the Americans are using the system as well."

Competition between Eurolex and Lexis for customers in the UK will inevitably be fierce, because of the limited number of people able to understand the text held on the systems.

"There are only 40,000 lawyers in the UK, compared with 78,000 in the state of California alone," commented Bosworth.

As well as qualified members of the legal profession, many universities, polytechnics and government departments subscribe to one or other of the systems. Eurolex claims to have 90 users in the UK, including ICI, and a number of European clients, while Lexis has over 2,000 in the UK and "many thousands" in the US.

The next step for both companies will be to expand the service to cover more countries. Lexis is in the process of adding French case material, but Eurolex is keeping its options open.

"We have an open-ended policy for the future," said Arthur. "We are open to gateway arrangements throughout the world."

Core dumps bypassed

FLOUGHING through core dumps may become a thing of the past for IBM DOS users following the UK release of a debugging tool by Namic, the Luton-based software distributors.

Namic has announced the availability of Abend-Aid, a product that uses the computer to analyse aborted program runs, for DOS/VS and DOS/VSE machines.

Developed and owned by Compupware of Michigan, Abend-Aid is stored in the Shared Virtual Area of the operating system and intercepts calls to the standard IBM core dumping process when a run aborts. It then examines error codes and produces an analysis of the run failure, allowing the run to continue with a core dump if there is insufficient information for the programmer.

SOFTWARE BRIEF

DBMS for Vic

MARCH will see the introduction of a database system for the Commodore Vic 20. It has been produced by Stage One Computers of Poole, Dorset, and is expected to cost around £50. Stage One claims this is the "first serious business-type program on the Vic."

Timelord to US

TIMELORD, the time recording, microprocessor based package, is to become available in the US and Canada under the new name CTT 3000. The designer and manufac-

turer, ITR International Time of Poole, Dorset, has appointed Cincinnati Time of Ohio, a subsidiary of General Signal Corp, as a representative.

ENHANCEMENTS announced by IBM for its popular word processor, the Displaywriter, will enable it to be used for data entry, inquiry, update and personal computing. It will now support datastream compatibility under IBM's Systems Network Architecture (SNA) for certain functions of the 3270 family of data processing displays and printers.

by Maggie McLening



Information on Merseyside Transport's 1,200 vehicles will be provided by Busman.

Bus system tells passengers where to get off

A BUS fleet operating system, which provides passengers with route instructions as well as local timetables, is being installed by the Merseyside Passenger Transport Executive.

Developed by Wootton Jeffreys & Partners, the system is designed to increase the number of riders by expanding their awareness and knowledge of public transport, according to Richard Williamson, associate partner of the Woking-based systems house.

Merseyside Transport has a fleet of 1,200 vehicles. The Transport

and Schedule Compilation, or Busman, module which it has ordered will initially be provided on a bureau service while an assessment of savings is made.

Busman covers the four main requirements of a bus company: operations, planning, marketing and administration, and produces timetabling and personalised passenger information as a spin-off. The operations package forms the nucleus of the system, covering such tasks as crew and vehicle scheduling and production of bus routes involving travel on buses,

relief opportunities.

The system runs on the Prime range of microcomputers from the model 400 upwards, but Wootton Jeffreys plans to extend it to other equipment when demand has been established.

"We would like to make it more portable," explained Williamson. "We could take the input/output part and put it on a micro. Linking with mainframes will also be possible."

tubes or by rail, and can generate a timetable for a neighbourhood to be handed out for publicity purposes.

"Half the people travelling round the public transport system are unaware of the opportunities it offers. Our object is to increase ridership by awareness and knowledge," Williamson explained.

Costs of the system are on a sliding scale, from £20,000 for a large operator, such as London Transport, down to £6,000 for a fleet of 100 vehicles.



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Figure 2. Topics currently under development (from the JIPDC preliminary report).

Basic application systems	1-1 Machine translation system 1-2 Question answering system 1-3 Applied speech understanding system 1-4 Applied picture and image understanding system 1-5 Applied problem solving system
Basic software systems	2-1 Knowledge base management system 2-2 Problem solving and inference system 2-3 Intelligent interface system
New advanced architecture	3-1 Logic programming machine 3-2 Functional machine 3-3 Relational algebra machine 3-4 Abstract data type support machine 3-5 Data flow machine 3-6 Innovative von Neumann machine
Distributed function architecture	4-1 Distributed function architecture 4-2 Network architecture 4-3 Database machine 4-4 High-speed numerical computation machine 4-5 High-level man-machine communication system
VLSI technology	5-1 VLSI architecture 5-2 Intelligent VLSI CAD system
Systematisation technology	6-1 Intelligent programming system 6-2 Knowledge base design system 6-3 Systematisation technology for computer architecture 6-4 Database and distributed database system
Development supporting technology	7-1 Development support system

Fifteen years is a long time in the industry

LOOKING through desk drawers some weeks ago as part of a New Year's tidy-up I came across a diary for 1967. It was kept up diligently as far as mid-March, which for me is about par for the course.

The year 1967 was about three years into my computing career and just about three months into my responsibilities for computer education. I can still remember the dreaded mixture of excitement and fear that the education task presented, because my brief was to consider the data processing learning requirements for, on the one hand, young students already launched in computer science basics, and on the other more mature "uneducated" commercial programmers and analysts on day-release.

The number of textbooks on business data processing at that time were countable on the fingers of an armless man.

This dreaded excitement it was, then, that led me to ask plaintively

of my diary: "I wonder how distant is the day when to admit to being 'something in computers' will be as passé as admitting to being 'something in the City' is today?"

I won't go into whether the second part of the comparison was a fair comment, but shall assume that you can see that I was driving at.

Apart from a few covert wishes discernible to me now in that rhetorical question — such as the one for the day when teaching the subject from a book might reduce the ludicrously high lecture preparation time by 90% — I remember that it was my practitioner's hat that I was consciously wearing when I wrote it.

At the time I found myself living a noticeably double life. In the work environment I was something of a Kermit — bright but still green — while in the educa-

tional environment I was regarded, rather embarrassingly, as an awe-inspiring expert.

And it wasn't just the word "computer" that inspired that awe but also the associated phrases "data processing" and "systems analysis."

Nowadays, it is rather different. People are much more likely to have come into contact with computers in their work. They are familiar with the idea of processing data by computer and with the analysis of a problem with the aim specifically of producing a computerised system.

Even the abbreviations DP and SA hardly seem jargon to them now. There is a possibility even that the very need for the specialist systems analyst and programmer is believed to be fading. "You don't need a chauffeur to drive your car, nor a degree to be able to drive it yourself, and now that we have microcomputers for the price of television sets, the argument can be transferred to data processing."

If the use of computers in the business environment does become as easy as driving a car, I hope I shall be among the first to see it and admit to it, but from what I see at present I don't think that this will happen for a long time yet.

If you are a worried analyst who thinks otherwise you may call me a cock-eyed optimist. I turn the tables and call you pessimistic. In reply to your "They don't need our specialist skills any more" argument, I tell you that you are over-reacting to the threats of a rapidly changing environment. Doctors, architects, engineers, lawyers, mechanics, plumbers — these among others,

when Sir John Wall announced his retirement as chairman of both ICH and ICL. He was replaced by one of the ICL board's Messy representatives, Tom Haddon. Alex d'Agapeyeff, immediate past president of the BCS and chairman of Computer Analysts and Programmers was awarded the OBE he was awarded in the New Year Honours List. Dataakil, ICL's software and operational services company, reported external revenue of over £1.25 million in 1976/77, estimated to rise to over £2 million this year.



Alwyn Jones is senior tutor in the business systems analysis team at City University in London. His special interest is in the application of systems ideas to the practice of systems analysis and design.

have all had to cope with changes in recent decades.

They have continued to exist as professions and trades in spite of the genuinely usable do-it-yourself machinery that has become publicly available.

There are, of course, special problems in connection with computer work. For example, titles are still under a process of change. O & M, the seed-bed of systems analysts, has certainly receded as a specialist job title, although O & M is still what every good systems analyst practices. "O & M plus computing" is still a reasonable way to define systems analysts, after all.

The systems analyst is still "something in computers" and perhaps it is rather passé to admit to being that nowadays. It doesn't sound as adventurous as it did in 1967, certainly.

But it is a very much needed type of specialist job in my view and that is much more important than where it stands in the fashion stakes.

Alwyn Jones

Key to new lease of data life

AT this stage in computer development, implementing a new computer system should be plain sailing. Once the various switches, controls and operating instructions have been mastered, all should be plain computing.

But smooth computing seems about as rare as a service engineer after 5pm (4.30 on Fridays), or a software package which fully meets user expectations. Even IBM, an organisation not normally noted for spreading measures of alarm and despondency in computing circles, has drawn up a list of hazards which companies face when getting involved in data processing.

Derek Gange, of IBM UK, has compiled a list of four critical stages users must go through during implementation. They range from lack of computing management, proliferation of new applications, control of escalating budgets and finally, a move towards micro independence by end users which results in unco-ordinated company data flows.

The IBM solution is to maintain an overall information strategy, both before and during implementation stages.

There is, however, another approach to computing which is increasingly finding favour with users — and not just those in the first-time user category. Turnkey computing operations have become a well-established part of the computer industry, particularly with those changing or supplementing their systems with small configurations, and those wishing to avoid the perils of the IBM list.

Compact computer systems are now reasonably priced, and fully capable of sustaining fairly advanced procedures. First-time users could find themselves

involved in creating information databases or planning local area networks or, as often the case, interfacing a stock control system with the warehouse and central accounting procedures. Maintaining an in-house specialist team to initiate, develop and operate the equipment and related software is not a viable proposition.

Bridging this manpower and technology gap would take more than the combined resources and facilities of the IT22 promotion team. Turnkey facility companies have certainly taken on a new lease of data life together with an increased number of customers.

A turnkey operation would seem to offer the best of all computing worlds to the prospective user. On the equipment level, many turnkey companies act as distributors for major brands of computer hardware, such as Digital and Hewlett-Packard, that is readily available, easily serviced and well tried and tested.

On the software side, the turnkey companies can afford to retain a high quality team of system designers and programmers. Once a new application package has been developed, the cost can be offset by supplying the basic system to several users, the ready-for-use price being highly competitive and cost effective.

With computer personnel becoming increasingly in short and expensive supply, letting the turnkey company take the computing strain certainly makes sense.

For the DPM, however, this is one key he would prefer to be without — unless he joins IBM's sets up his own turnkey company.

Alan Simpson

Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, March 4, 1982

Go to the Middle East, young man

WHILE some British businessmen cry into their beer over the state of the economy, and blame any corporate failure on the world-wide recession, others have discovered one geographical area where there is not even a word for recession in the local language — the Arabian Gulf.

Although this area of the world is immensely rich, the source of its wealth, oil, is finite. It is well recognised that there is an urgent need to establish a stable industrial and commercial base if current living standards are to be maintained.

Owing to the relatively sparse population, only 20 people per square kilometre, much of the clerical effort involved in setting up businesses in the area has to be imported.

While the countries of the Middle East are in the invidious position of owning much of the planet's oil wealth, they also have the dubious honour of being pawns in the global game of Monopoly being played out by the superpowers.

□ □ □ □

The area is, however, more at risk from within. The entire region is effectively run by foreigners. The routine office and manual work tends to be carried out by imported Asian labour, while Europeans and Americans provide most of the technical expertise for running high technology installations. True stability in the Middle East will not be achieved until its countries are back in the hands of its own people.

One of the hidden trends of computerisation in the Middle East is to replace the bulk of migrant labour with information technology, and governments are actively encouraging the spread of computers to meet this aim. In 1980 over £74 million was spent on imports of computer equipment. The largest share — £26 million — came from the UK.

Unfortunately, for too long the Gulf has been at the mercy of expatriate Europeans and Americans who see the area as an easy touch. The idea has lasted that buyers in the Middle East are naive and will continue to pay vastly inflated salaries to people who in reality are not worth it, and most of whom would have trouble even holding down a demanding job at home.

What the Gulf nations want is a burgeoning local DP sector, both managed and manned by local staff. To help secure that, what is also most definitely wanted is professional help in setting up installations and training the staff to use them effectively.

□ □ □ □

Although some Gulf countries are setting up some form of centralised training facilities, such as the NCC in Abu Dhabi, and the Computer Training Centre in Kuwait, much of the training expertise still needs to be imported.

Some UK firms have already responded to the challenge. Among the more recent is Altergo, which won a £2.5 million deal from Saudia Airlines for a flight information system. One of the main reasons for its success was well-established training facilities (in Ireland) for Arab staff. Others are following.

It is not solely a European, or even developed country market, however. Snapping at the heels of Western suppliers are companies like Tata Burroughs, the Indian software arm of Burroughs which markets its packages and skills abroad.

It has already secured work in the US — a real coals-to-Newcastle success — and is handily placed to move into the Middle East. More Indian companies could follow.

While it is unlikely that the Middle East will ever develop an indigenous computer manufacturing industry, the home market is also certain to foster software houses.

In the meantime, there is a space for British firms to become more established. Cliché it may be, but for information technology the call remains: "Go to the Middle East, young man."

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Paul O'Nolan, of Dublin, who wins £5. The gadget that determines what a computer will do is the programme, or "floppy disc" as it is known in the business. This ingenious piece of software asks questions of the operator and all he or she has to do is answer them.

Sunday Tribune (Ireland).

LETTERS

Law is against public interest

I WOULD like to congratulate NCCD (whoever they may be — are they a division of NCCP?) on their very colourful advertisement (Appointments section, CW, February 18). It certainly caught the eye!

What a pity that they based a large part of their argument on a falsehood, and have caused considerable worry to very many people as a result!

Let me state the facts for the record. Those contracting companies who find work through agencies will not have 30% of their income deducted at source from April 5, 1982. This was originally a proposal within the 1981 Finance Bill, but was withdrawn after

substantial objection from the industry.

The Inland Revenue has now issued a consultative document entitled Taxation of Agency Workers Operating Through Companies, which is being examined by the industry and by accountants. Should these somewhat modified proposals become law, they will take effect from April 5, 1983 at the earliest.

Many of us in the industry feel that the legislation now proposed is unfair to those companies who, for a host of reasons which I won't go into here, prefer to work through agencies.

For a start, the proposal is

against the public interest. The government has acknowledged that new jobs are primarily created by small, young, dynamic companies. Removing 30% of their income (albeit temporarily) will do nothing to encourage such companies, and may well stifle them.

On behalf of one agency, I would like to state that we will accept any challenge that NCCD might offer. We know that we give value for money; time will tell how effective (or ineffective) NCCD will be.

ALAN J. NORRIS
Chairman

Computestaff
London SW1.

Redac software

I READ with interest the article by Kevin Cahill covering the activities of Nokia. As the article reflected, it is an extremely progressive company and has invested well in establishing good technology.

However, I must correct a basic inaccuracy in the article. Reference is made to "the use of Redac computer-aided design equipment with CALMA software."

There is no CALMA software, or for that matter any other software, used with Redac CAD installations at Nokia. The systems operate with Redac-supplied hardware and software.

Nokia became the first Finnish company to install CAD in 1975 when it implemented our PCB Design System using DEC PDP-15 hardware.

To supplement the new PC manufacturing capability, to which Kevin Cahill referred, Nokia installed three of our MAXI systems. More recently it has installed our low-cost Cadet PCB Designer in some of their divisions outside the Kilo facility.

I believe that Finland, through Nokia, is showing that you certainly should not underestimate a country's capability simply because it is not large. Modern technology is now readily available for all who have the foresight to make the investment.

KENNETH WYATT
Director

Racal-Redac AB,
Stockholm,
Sweden.

Headhunters are quite harmless!

ALAN Williams's jaundiced piece about "headhunters" calls for a reply from one of them, for he and I seem to have been living in different professions instead of — as I understood — the same one.

In the first place, in 10 years as a headhunter, including writing articles, giving talks, etc on executive search, and with a very wide acquaintance in the profession, I have never before met anyone who thought that the term "headhunter" was pejorative.

Like most of the best American slang — phish, amusing and otherwise harmless — the word has crossed the Atlantic and simply worked its way into our everyday language, so that now the cream of the profession refer to themselves as headhunters entirely interchangeably with "executive search consultants."

If Williams wishes to set himself up as an arbiter of ethics he should not beg the question and steal the answer by means of odious and emotive expressions like "hit-

man." I strongly suspect that he has invented the term "roll-over merchants" for the purposes of his article.

Certainly I have never heard of it, though the activity he associates with the term (moving the same recruit from one place to another at a fee each time) is specifically forbidden in the Employment Agencies Act, 1973. Williams gives no sign of knowing this.

Incidentally, the Act makes no distinction between re-approaching a recruit one has just placed and re-approaching someone whom one placed 20 years ago, and this is not the only way in which the Act illustrates the futility and unreality of trying to legislate moral behaviour.

In my experience, which is not limited to searching in the computer industry, headhunting in this country is carried on, generally speaking, as ethically as banking, medicine, the law or what-have-you, and I can only suppose that Williams was trying to be contro-

versial, or even provocative. If so, he succeeded.

BERNARD BABOULENE
Managing director
BLB Consultants
London SW20.

Printer is available

PETE Wilson and others (Letters, CW, February 18) will be pleased to learn that a 160-column printer is available, from Al Peripherals. So too is a microprocessor controlled interface to ICL mainframes and full support for the total package.

MIKE MANSFIELD
Al Peripherals
Windsor, Berks.

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

Copyright legislation is still urgently needed

IN an article on software protection (CW, December 3, 1981) I suggested that the Exon case decided by the Court of Appeal in June last year was a threat to the existence of copyright in computer programs.

Bryan Niblett (CW, January 28) agrees with my view on the urgency of the need for legislation but he dismisses my suggestion that the Exon case is a threat. Unfortunately the reasons that he advances are gravely flawed.

The Court of Appeal decided that the word "Exon" was not an original literary work so as to be protected by copyright. It did so because it recognised that, although it was an original work, it was not "literary". The Court relied on a definition of literary work as one "intended to afford either information and instruction, or pleasure, in the form of literary enjoyment."

Niblett argues that cases decided under old Acts (in this case, the 1842 Copyright Act) cannot be applied to modern circumstances, and he contends that the Copyright Act 1956, which is now in force, has greatly extended the range of things which will be treated as literary works.

What Niblett seems to have overlooked is that his argument is exactly the one put forward by Exon in the Court of Appeal: but they lost. The Court of Appeal ex-

pressly rejected this argument, and said that the old test applied exactly to the 1956 Copyright Act, as it had to previous Acts, and was as appropriate today as it ever had been. This rather sweeps away Niblett's main point.

His other point is that the Exon case decided nothing more than that a single word did not obtain protection, and that this would not affect programs consisting of more than a single word. However, the effect of a decision of the Court of Appeal is not merely that the same set of facts would be decided in the same way in a later case: what is applied in later cases is the reason for the decision, the principle it lays down. The reason for the decision in the Exon case was that a single word was not a literary work because it failed the information/instruction test.

It is that principle which survives the case, and has to be applied to new cases as they arise. Bryan Niblett draws some comfort from the old cases which establish that copyright subsists in a list of invented words devised for use as telegraphic codes. Those lists were invented to afford information and instruction, and were intended to guide the workings of the human mind, not the operations of an electronic device.

I share Bryan Niblett's hope that copyright in computer programs will be found to survive despite the Exon case, and I hope that readers will join Bryan Niblett and me in exerting what pressure we together can to bring about early legislation.

N. D. F. BOHM
Solicitor

10 YEARS AGO

From Computer Weekly of March 2, 1972 . . .

THE Treasury offered to reduce charges paid by freight agents using Laces, Heathrow Airport's computerised cargo system to £6,000 annually per VDU — about £2,000 a year less than its original proposition . . . A data link between BEA's Rome office and the Beacom Computer Centre in London was inaugurated by British Ambassador Sir Patrick Haddock . . . Ampex announced the discontinuation of its European and user sales operations . . . A new era for ICL began at the annual meeting of International Computers (Holdings),

when Sir John Wall announced his retirement as chairman of both ICH and ICL. He was replaced by one of the ICL board's Messy representatives, Tom Haddon . . . Alex d'Agapeyeff, immediate past president of the BCS and chairman of Computer Analysts and Programmers was awarded the OBE he was awarded in the New Year Honours List . . . Dataakil, ICL's software and operational services company, reported external revenue of over £1.25 million in 1976/77, estimated to rise to over £2 million this year.

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DOWNTIME Wanted — a paragon of all the DP virtues

WANTED: an ambitious high flyer keen to cut his teeth on the challenging management problems of our computer age. Must be under 40, numerate, eloquent, articulate, dominant in committee, in possession of an honours degree, ten years in the computer industry, proven track record, adept at handling the Press, lots of drive.

Who is there to fit such a description anyway?
Hurry to find out. Lasked one of my colleagues to suggest a name.
"Um . . . Eureka! Robb Wilmore," he said.
Indeed. But for the less able mortal, would it not make a refreshing change to see job ads like: Bags of fun (but not under the eyes) for illiterate imbecile with propensity to day-dream and un-punctuality.

Palming with printouts

MORE astrological news from Canada: An ex-elevator mechanic, now a self-taught psychic, decided to exploit the apothecary of the computer. He also taught himself to program in Basic, and then bought three Apples, four Panasonic screen monitors and bundled the lot in the back of a truck.
Now he tours fairs and sells his

In the steps of the SAS

MYSTERIOUS going-on in God's own country. Last December, 12 ICL customer engineers were sent on a training course in the Brecon Beacons. Details of what went on are sketchy, but rumour has it that it was the course used by the SAS for endurance training. Does this mean that ICL is poised to win the prestigious order for Britain's

Testing time with the optician

I WORK my ICL tie with pride for a visit to the optician.
"Ah!" quoth the optician in instant recognition of my chauvinistic attire, "you must be one of those computer fellows."
"Aye," I replied.
"Why, I nearly bought a computer once. For stock control, don't you know?"
"Bully for you," I yawningly replied. "I've come to have my eyes looked at," I added impudently.

Scalpel fantasy

THE redium of everyday data processing can often be relieved by indulgence in idle fantasy. This can be kindled by a suitable prompt from the computer, and I am happy to give you one definitive example, courtesy of one of our leading hospitals.

Bleary-eyed users there switch on a library terminal of a morning, and elicit the prompt "EXCUSE!"
Following with the hollow laughter of a person telling someone else's joke for the umpteenth time, the user then fills in the name of the applications program: "Margaret Thatcher."
And to think they paint hospital blue for her!

AT last I learn how a computer package called Ross, developed by Lamson, the Local Authorities Management Services And Computer Committee, enables savings to be made on rubbish collection. It selects the paper from the rubbish and sells it to Lamson for recycling, and eventual use in its free releases — although I would

Where does it all go?

not wish to criticise the words themselves. Perish the thought! A recent release telling of Lamson's penetration of the US refuse collection market proudly boasts: "100% recycled paper."

All I can tell you is that it is good for mopping up ink blots.

Chad

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CAFS — a pace-making product that's storing up marketing headaches

ANY idea that products which put end users in direct contact with the computer make programmers redundant, can be dispatched by the experience of ICL with its CAFS controller.

In simple terms, CAFS is a hardware solution to a software problem; but to many of its development team it must still seem more of a problem than a solution. The ICL Content Addressable File Store enables selected data to be retrieved from a base for central processing at the speed at which it comes off the disc. This allows enquiries to be performed much faster than with conventional methods which combine software and raw processing power.

But CAFS has limited applications, and is another example of a pace-making UK product creating marketing headaches.

Although the existing version on the market is widely recognised as

a fine product (even by IBM), it is at present limited to batch query applications, and is of little use in online systems.

Within its field, however, it is very flexible and provides the ability to hunt out groups of data under a wide range of selection criteria.

Let's begin the story with ICL's mainstream data management method, IDMS — Interactive Database Management System. This allows the construction of a database through which there are navigational paths for those activities which are predictable.

It consists of many record types connected by relationships called sets. These sets in turn can be owner or member sets, or both at once.

Programmers writing applications with IDMS do so using special Cobol verbs such as FIND and OBTAIN. These are compiled

by a preprocessor to yield typically between two and four lines of executable Cobol code. The preprocessor also copies in record layouts and descriptions at run time.

The construction of an IDMS database requires careful thought in order to build the most useful navigation paths. The navigation also poses problems at run time for programmers writing applications on such a database.

Entries to the database are expensive, and it is an experienced programmer who keeps these down to a minimum by making the most of each access.

The whole database is known as a schema, and a predefined part of the base is a subschema.

Where the applications of a database can be predicted, and there is little prospect of it having to be changed, IDMS bases are efficient.



CARMICHAEL... "An example of a splendid UK invention not taking off as it should."

But once built, they cannot easily be changed, and are inefficient in handling unexpected enquiries. Enter CAFS — a simple approach to the storage of data, says ICL. Fields of data elements, each with an identifier, are combined

into records, which in turn are organised serially in cells. In fact the whole CAFS process is based on simple — old-fashioned if you like — sequential organisation. This is dictated by the hardware configuration of the CAFS processor, which simply calls off the requested data as it comes from the disc. It picks out the desired fields from records satisfying selection criteria.

Up to 16 selection criteria are allowed which may be combined with ANDs and ORs in boolean expressions to satisfy relatively complex requirements in a single pass.

While the selection mechanism searches for a record for a field which matches the criteria, a parallel mechanism extracts from the record those fields which have been requested for entry to the mainframe. At this point it does

Reaction of technical people is bad, but since the facilities can't be had otherwise, the criticism is somewhat irrelevant

not know whether the record will finally be selected.

After a record has been scanned, each key of the selection mechanism is examined and a key bit is set if there is a success. If all the keys are satisfied, the record is christened a hit.

CAFS 800 is the version which has been on the market for several years and it operates on the larger of ICL's current processor range in the DMS environment.

So far seven have been sold — "an example of a splendid UK invention not taking off as it

by Philip Hunter

should," says its marketing manager Hamish Carmichael.

So why has it not taken off? It is very fast, with average throughput of data from disc to scanning mechanism typically two Mbytes per second. People who use it love it for what it is good at, which is extracting information from groups of records with identical formats.

But for potential purchasers there are three snags:

1. It is expensive — a CAFS controller costs £175,000, and other cheaper query systems are available.

2. Its field of application is limited to sequential and relational databases.

3. At present it uses IDS 80 discs, which are small and old-fashioned by today's standards.

These points I raised with Carmichael, who is more than a mere marketing manager, having been involved with the development of CAFS and written several technical papers about it.

Of the third snag, he answered: "Reaction of technical people is bad, but since the facilities can't be had otherwise, the criticism is somewhat irrelevant."

On price, Carmichael claims that the large initial investment would be recouped by manpower savings. "Each implementation of CAFS will save between four and six man years."

But he adds, with justice on his side, that other cheaper query systems are but carthorses by comparison.

CAFS' biggest failing is that it cannot be used with ICL's conventional IDMS databases. Carmichael attempts to answer this criticism by referring to a paper he has written about a study whose aim was to reconcile the CAFS and the IDMS approach.

The idea was to establish an IDMS database on CAFS discs and then to confirm that it was possible to access the base both in the CAFS mode for enquiry and in IDMS mode for following connections between related records.

There is no way that CAFS can read the data in IDMS form. So it was necessary somehow to disguise the IDMS data in a form readable by CAFS. This was achieved by converting IDMS records into CAFS records by picking out groups of fields which would fit the CAFS format and inserting appropriate headers and trailers.

The experiment was a partial success in that access by both modes was shown to be possible with reasonable speed. But only very simple data was used, and even so some ambiguity was observed when an attempt was made in CAFS mode to obtain data stored in more than one type of record in the original IDMS base before conversion. With more complicated data structures, this ambiguity could become chaos.

The strength of IDMS bases lies in the ability to link records of different kinds to suit the required applications. Surely it must be possible to exploit this in CAFS for faster retrieval of information. At the same time, CAFS indexing techniques could be applied to IDMS data.

Married to his work?

ETHNIC jokes have long been a source of amusement in every nation. They are based on the fact that people next door are always more stupid, and hence the English tell jokes about the Irish, the Dutch, the Belgians — and computer programmers about operators.

One tale, which I swear is true, concerns an operator who married a programmer. He was consistently nagged to take night classes in computer science in the hope of moving to her side of the computer room door.

He tried, but failed his exams, and as a result was soon socome more a single man. He is still an operator today.

I suggested that he might have gone far had he succeeded in his exams.

"Stiff and nonsense," came the reply. "I'd have the worst of both

worlds — a programmer and married to a programmer."

A trifle harsh, I feel, but if such rhetoric enables operators and programmers to live together in superficial harmony, so be it.

PUZZLER

JUST added another "true" alphabet to my collection, this time totalling 56. Your job is to identify the ten digits involved. See page 54 for solution.

SIXTE EN
SIXTE EN
SIXTE EN
TWO
TWO
TWO
FIFTY SIX

OP SPOT

Tale of the bike with a computer in the tail

UNTIL a few days ago, the most fun I'd had while operating a computer was when I managed to get most of the treasure out of the dragon's lair during an all-night Adventure session.

That was until I sat in my local one balm February evening. The geyser quiet was interrupted by a soft burbling noise outside the window. Peering out, I saw a young man parking an obviously new and not impressive motor-cycle.

As he walked away from it, trying very hard (and succeeding admirably) to appear nonchalant, I identified the machine as a Honda CX500 Turbo.

Having read in the motor-cycle Press of this machine, I was aware

When the power came in, it pulled like a train — and kept on pulling

that it boasted computer control of all engine functions.

This seemed an opportunity too good to miss. I arrived at the bar at precisely the same moment as the newcomer.

"Nice bike, is it yours?" I asked. He needed no further prompting, and we launched into an enthusiastic discussion on the merits, or otherwise, of various high performance motor-cycles.

The CX500 has a V-twin engine which, because of its uneven firing pattern, is probably the most difficult configuration to turbocharge effectively. What is needed is a sophisticated control system — and what more sophisticated control system could you have than a microcomputer housed in the bike's tail?

The computer is responsible for supplying each cylinder with exactly the right amount of fuel under any circumstances. Sensors

measure the throttle opening, atmospheric pressure and temperature, the engine water temperature, and the individual cylinder intake pressures. The analogue readings from these sensors are converted to digital information, and fed to the processor.

The computer, built in Japan by Nippon Denso, which also supplies electronics for turbo-charged cars, decides on the correct amount of fuel to be supplied to the cylinders by the solenoid-controlled injectors. Because the intake and firing events are unevenly placed within the timing cycle, each injector is triggered by an electronic pick-up sited on the end of the camshaft.

If one of the sensors should fail, the computer resorts to default values for the affected parameter, which enables the bike to be ridden with reduced performance until the defective component can be replaced.

If the turbocharger waste gate, the device which limits boost pressure, fails, the computer progressively weakens the mixture to reduce the amount of forced induction, thus avoiding the risk of a disastrous (and expensive) mechanical failure.

Apart from the normal running curve, which the computer is programmed to follow during most running, cold starts are facilitated by a second curve. No choke is fitted; and when the engine is cold, an air valve opens, allowing extra air to bypass the throttle valves.

The computer allows extra fuel to be injected and when the starter motor is actually turning, double the normal amount of fuel is supplied.

As the engine warms up, so the air valve is closed by an electrically-heated bi-metallic strip. If the engine is already warm, the strip is kept shut by engine heat.

On cold days, or at high altitudes, the air temperatures and pressure sensors supply the computer with

Doubling the workload

BUMPED into a pal from International Mbwloflots the other day, and was told of the problems they'd been having at the East Geven data centre with a new communications processor.

Apparently the device has refused to talk to the rest of the comms equipment since its delivery late last year. A software specialist has been working full-time to try to rectify the problem, and the errant device has so far

managed to drive the grand total of one VDU.

On the day I met my erstwhile workmate, the technical support team were confident that more devices could be attached.

"We're going to double the workload today," he announced proudly.

"You're going to connect two videos?" I asked incredulously.

"No, we're going to sit two operators at the one that works."



"And this is Ronnie — he boots the system."

by Andrew Thomas

to ignore all other constraints should the throttle be opened faster than at the normal rate, and to inject fuel immediately.

Full acceleration is still not available until the turbo is spinning at its optimum speed.

If the main computer should develop a fault, it is unlikely that it will immobilise the bike completely. The processor has enough resilience to enable the vehicle to be driven to a dealer for attention. Should there be a hard fault in the computer itself, it is simply replaced with another unit.

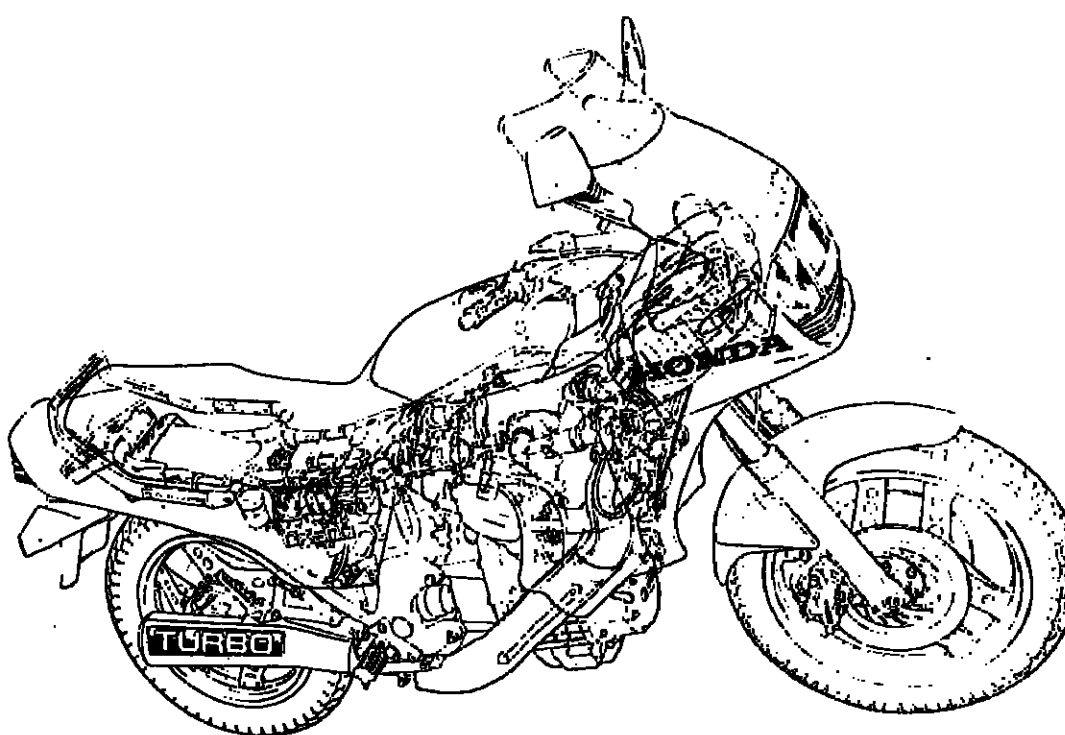
Meanwhile, back at the pub, the proud owner of the machine made an exceedingly generous, not to say foolhardy offer.

"Would you like to try it?" I was sitting on the bike before his mouth was closed. The performance of the CX500 Turbo is theoretically similar to my own Honda CB900, so a comparison would be relatively easy.

On the short run I made, the power delivery was the main difference.

The turbo-engined bike seemed to lack the initial enthusiasm for acceleration of my faithful old steed, but when the power came in, it pulled like a train — and kept on pulling.

At £3,350, it is by no means a cheap means of transport, but it does offer the chance to operate a computer — and thoroughly enjoy the experience.



A computer that travels at 120 mph — in the tail of a turbocharged motor-cycle.

enough information to adjust fuel metering accordingly.

One of the main problems presented by turbocharged engines is that of throttle lag. If the throttle is opened quickly, full turbo boost

and hence maximum acceleration, is not available until the blades of the turbocharger are spinning fast enough to force the mixture into the cylinders.

The turbo fitted to the CX500 is

extremely compact, and its moving parts have a correspondingly low mass and inertia which reduces this effect to some degree. In order to improve performance in this area, the computer is programmed

PLEASE LET ME SAMPLE PT7

Name

Address

City

Postcode

Telephone

Business hours

Other

Signature

Date

Comments

Notes

Remarks

Instructions

Specifications

Drawings

Photographs

References

Links

Footer

PEOPLE

Hands-on experience offer to teenagers

TWO firms are getting into the spirit of IT Year by giving youngsters practical computing experience.

Children between the ages of 12 and 14 in and around Blackpool are to learn the basics of programming personal computers on a 13-week course, consisting of two hours one evening a week, courtesy of Guardian Royal Assurance. The course caters for 20 children at a time and is centred around Sinclair ZX81 machines.

Management consultant Inbucon is running three days of workshops in Birmingham, where 150 West Midlands youngsters will take part in a one-day intensive course on microcomputer technology.

Inbucon normally charges about £100 a day for its tuition, but will be donating the workshops free of charge. All other costs, such as lunches, are being met by the Midlands region National Girobank.

Dan Remenyi, Inbucon Management director, said the idea was to give first-time hands-on microcomputer experience to as many teenagers as possible.

Three join Peachtree

THE collapse of BMG Microsystems meant redundancy for Michael Bennett, Jonathan Osborne and Mark Hodgson. But all have now found employment with software supplier Peachtree International.

Bennett joins the company's software team. He was previously in mechanical engineering, followed by computer operation, programming and analysis.

Osborne and Hodgson have been appointed programmers at Peachtree. After gaining a BCS in computer science at Portsmouth Polytechnic, Osborne joined IBM and later BMG as a programmer. Hodgson is a relative newcomer to the industry. His first computing job was with BMG where he worked from November 1980.

Executives on the move

JOHN ROBINSON has been appointed to the board of Leasco as sales and marketing director. He was formerly sales manager.

Roy Martin, systems operation manager and David Smith, sales and marketing manager, have been elected to the Press Computer Systems board. Martin has been with Press since 1974 and Smith

joined the Wolverhampton-based company last year.

Director of sales for Eurolink Computer Service is David Jarvis, former director of sales for Europe with American Express.

Chris Swindon, previously marketing manager for Kings Town Photocodes, has been promoted to sales and marketing director.

David Smith, group commercial manager of Gordon and Gotch has been appointed associate director of the company. He joined Gotch in 1976. With Bernard Higginson he becomes a director of the group's computer supplies subsidiary, Gotch Continuous. Higginson has been with Gotch Continuous since 1979 as a senior sales executive, and is now sales director of the company.

Bob Gray has joined the Eastern regional office of Benson Electronics as a sales executive. He was previously UK sales manager with MNG Associates.

CONFERENCES

A HALF-DAY seminar for chief executives of computing services companies will assess trends in manpower requirements and the need for further development of training requirements. Organised by the Computing Services Industry Training Council, Cost, it will be held on March 10 at the Roof Restaurant in the London Hilton Hotel. Fee is £45. Details from Cost, Fifth floor, Hanover House, 73/74, High Holborn, London WC1 6LE. Tel: 01-242 5049.

THE Hilton International Hotel in Park Lane, London, is the venue for the second International Computer Conference (ICC), on March 11. It is an OBM conference and exhibition, aimed at the quantity buyer - OEMs, systems houses and large end users. Starting at 9 am, there will be a series of technical product seminars covering Winchester disc technology and back-up, raster scan graphics and thin film technology in high-density disc drives. This afternoon will be taken up with a product display. Attendance is by invitation only, obtainable from Ron Lewis at Text 100, or from the exhibitors, free of charge. Lewis can be contacted on 01-954 4477.

A STATE-of-the-art conference on data analysis methodologies and database design has been organised by the BCS Database Specialist Group. It will be held at the Dart-

Seymour Hosking is to head CMG Computer Management Group's Edinburgh office. He has previously worked with IBM in Canada, International Air Transport Association in Geneva, the Scottish Amicable Life Assurance Society and Arthur Young Management Services. He joined CMG's Glasgow office as a senior consultant a year ago.

Peter Feltham, formerly division manager for the professional services division at Cincom, has joined CACI International's offices, reporting to London. Joining the company as a consultant is Jack Lowe. He was formerly assistant manager for Access Credit Cards.

Barry Ward has joined Base Ten Systems as Northern sales engineer for industrial systems. He joins the company from Fluke, where he sold test and measurement equipment in the North and Midlands.

John Clarke has joined Keen Computers as sales director. He joins from NEC, where he was responsible for the EDP division throughout Europe.

John Morrison has been appointed UK services manager at Burndept Electronics. He was previously service manager with Barlow Rand in South Africa and before that with General Electric of America, also in South Africa.

Alex Smith, former sales engineer for TDS products in the North-west, West Midlands and Scotland, has been appointed international sales manager of TDS in Blackburn, Lancs.

Tim Rees has joined RTZ Computer Services as training consultant for financial software packages Fascia and GL Plus. He was previously chief accountant at Rockware Plastics.

Hal Chenhall has been appointed UK sales manager at Datron Electronics. He joined the company as a sales engineer, but left for a short spell to join Rascal-Milgo.

Industrial revolution, Japanese style. IDPM West London to Oxford branch. Speaker from the Japanese Information Centre. Bull Hotel, Gerrards Cross, 7.30.

Practical networking. IDPM Scottish branch, Edinburgh University, Students Association, 60 The Pleasance, 7.30.

Seminar on data storage and retrieval. BCS Microform Group, National Computing Centre, Manchester, 1.45. Details from Chris Marles on 01-424 1031.

Short papers evening. BCS North Staffordshire branch, Physics Lecture Theatre, University of Keele, 8.00.

What's in the BCS for us? by Steve Shirley of F International. BCS Teesside and District branch, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland, 7.00.

BBB computer literacy project. BCS Wolverhampton branch, The Polytechnic, Wolverhampton, 7.00.

North Atlantic air traffic control. BCS Glasgow branch, Music Room, Staff Club, University of Strathclyde, John Street, Glasgow, 7.00.

Bill Osbaldeston has crossed the Atlantic to take up his new post as vice-president at VLI Group's recently opened New York office. He was previously UK general manager of Advanced Systems. He will take responsibility for sales and marketing of VLI's systems and programming consultancy services on the Eastern seaboard of the US.

George Goble has joined United Computing as a consultant for the London region, specialising in personnel systems. He was previously personnel services manager at Lucas CAV, where he worked for 11 years.

Colin Wier has been appointed sales executive at the Glasgow office of Computer Technology, CTL. He was formerly with Roughts, where he sold small and medium-sized commercial systems in East Scotland.

Michael Newstead is to be personnel manager at Compeda. He was previously a freelance personnel consultant.

Jim Willis has been appointed director of European operations at Haslettine. He also assumes direct control in the UK as general manager of Haslettine Ltd, based in Middlesbrough.

Steven Purchase has been promoted to technical director at Gresham Computer Services.

Dr Terry Chamberlaine has been appointed senior designer for sonar systems at Ferranti's Cheshire Heath division. He was formerly manager of new systems at Burroughs in Glasgow.

Following the retirement of data preparation manager Sally Catherall, Gordon and Gotch Computer Group has appointed Brenda Howes as her replacement. Sandra Goddard will assist as data prep supervisor. Howes joined the group in 1974, and Goddard joined in 1976.

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BOOKS - 1

Supernatural capabilities of computers

Supernatural capabilities of computers

The Kingdom of Sand: Essays to Salute a World in Process of Being Born. William Gosling. Council for Educational Technology. £4.50.

BOOKS concerned with the impact of computers on society are a penny. Such tomes usually decline into a tirade on police states and massive unemployment. Any technical detail is either superficial or incorrect, and they take an extremely narrow and short-sighted view of future change.

The discovery of a book which is objective, accurate, thought-provoking, and extremely well written is, therefore, something to be welcomed.

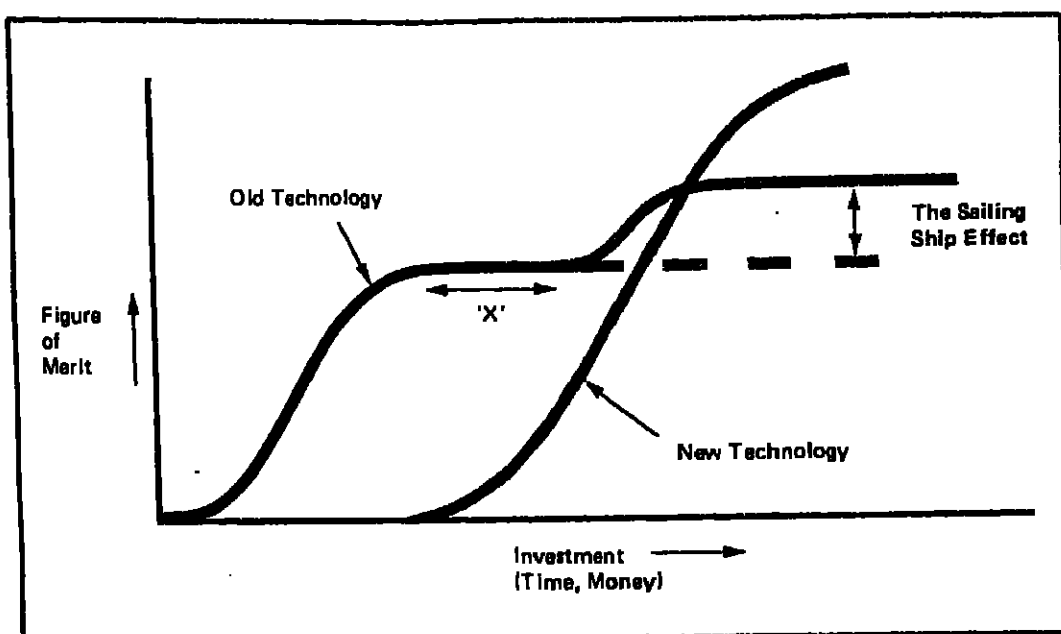
This collection of five essays was originally prepared for such diverse audiences as the graduate intake at Plessey and the nuns of La

Sainte Union Convent at Bath. In the space of 98 pages, it covers such diverse topics as energy crises, the breakdown of law and order, communications, life cycles of various technologies, ecological pressure groups and religious education.

There is a series of fascinating charts depicting, for example, the "sailing ship effect", whereby an old product, having reached maturity, ceases developing until threatened by a new technology.

This is illustrated by the advances made in the last generations of steam engines, sailing ships, and thermionic valves.

One could dine out on a considerable period of time on the wealth of fascinating revelations contained in the book. Did you know that the number of scientific journals published throughout the



The Sailing Ship Effect. In Region "X" the old technology stabilises, but grows again when challenged by the new.

world has doubled every 15 years since 1665? Or that the number of qualified engineers and scientists has grown exponentially, but with shorter doubling time - 10 years?

The risks involved in carrying this kind of statistical projection too far are illustrated by the ability to predict that, by the year 2100, the population of the United

States would be 1,000,000,000, every one of whom would be a scientist or engineer, they would all live in California, work for the US government, and be suffering from some unmentionable disease.

The final essay enters the realms of the supernatural - if a person could be represented as a code and stored in a computer, could he or

she be dumped to magnetic tape, stored for thousands of years, and then be reloaded into another computer without being aware of any interruption in their lives?

There are literally dozens of equally thought-provoking ideas in this book. Recommended reading.

Andrew Thomas

Practical aspects of micros

Practical Microprocessor Systems. Ian R. Sinclair. Newnes Technical Books (Butterworth). 139pp.

PRACTICAL Microprocessor Systems comes into the system design category, expecting the prospective reader to be familiar with the basic concepts of digital electronics.

The book concentrates on three microprocessor types: the National Semiconductor INS8086 - a machine controlled system; the Mostek 6502 - which is the basis of the Pet, Apple and Acorn computers; and the Zilog Z80 which is featured in many popular makes of microcomputers.

The intimate relationship between hardware, software, and firmware or monitor programs is made clear.

For the hobbyist, student or technician seeking guidance on the practical aspects of microprocessor systems, this book provides a worthwhile insight into the micro design world.

Alan Simpson

Author's aim 'doomed from the start'

Decision Tables and Computer Programming. R. Welland. Heyden and Son Ltd, London.

MOST discussion of decision tables has centred around their use as a tool in systems analysis and design. The author states that he wrote this text with the intention of providing an introduction to decision tables for scientists and engineers.

At present there are virtually no applications of decision tables in these areas, and the author's aim is, I feel, doomed from the start.

It is hard enough trying to persuade this book's potential audience that a one-week course in Fortran will not give them sufficient expertise to last them for the rest of their computing careers. Since they see computers strictly as tools, they want their interaction with the machine to be as simple, unadorned and painless as possible. The presentation of decision tables is far from undemanding in this text.

The first part of the book deals with the basic theory of decision tables and is clear and well-presented even if the diagrams are not very well-produced. The author's claims for the superior merits of decision tables over other techniques for expressing algorithms

are not substantiated anywhere in the text (and I suspect may not be substantiated).

The second part of the book discusses the automated processing of decision tables to produce programs. This may be of interest to computer scientists but is long, detailed and fairly complex. In places the text reads like a PhD thesis. In Chapter 6 interpretative approaches to decision tables are covered.

The final part of the book discusses applications very briefly. These include Filetab, FTLE and process control applications. For a book which is intended to encourage non-computer scientists to see the technique, the applications which could possibly motivate this are left far too late in the text.

In conclusion, while this book has some value to computer scientists, the ordinary scientist or engineer would find it extremely hard going in places. The original literature is heavily cited and in places exhausting. It could not be recommended to computer users outside the computer science community.

John Cookson
Senior computing officer with Edinburgh Regional Computing Centre

More to programming than mere coding

Advanced Programming and Problem Solving with Pascal. G. M. Schneider and S. C. Bruell. John Wiley and Sons Inc. 506 pp. £17.75 (hardcover) £7.35 (paperback).

THIS book is an undergraduate text in programming for those who have already used a high-level language. Its scope is ambitious, as evidenced by the titles of its five parts: The Pascal Language, Programming Style and Expression, Program Design, Data Structures and Program Implementation Concerns.

Quite rightly, the authors' chief concern is to convey that there is much more to good programming than mere coding, and that programming style, documentation, testing and maintenance are all worthy of serious and detailed consideration.

It is especially valuable to stress the importance of these topics in a teaching environment, where programming habits are being formed largely in the production of "student exercises" generally too small for the real difficulties of software production to become apparent.

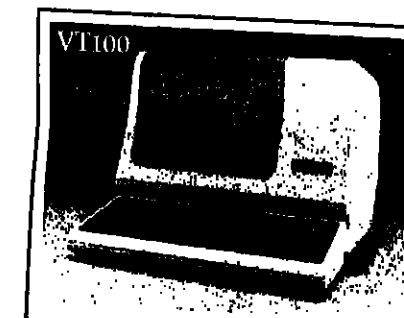
The coverage of these subjects is excellent, but unfortunately the presentation is only treated at the very end of the book. A useful case study does give a feel for the complexity of detail in a large project.

This is a fine introduction to good programming practice and the difficulties encountered in large software projects, and any teacher of programming could learn from it.

One minor complaint is that the inclusion in the main text (rather than an appendix) of a summary of Pascal and the ambitious section on data structures, both compromise the clarity of the book's important central theme.

Peter Wallis
University of Bath

Digital has created a family of terminals based on the idea that nothing works like a VT100.



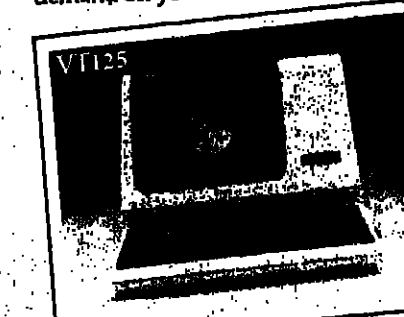
If you believe that nothing is quite as good as the VT100 in terms of power, performance and reliability, we have some good news.

We've taken all that you admire and created a new family of terminals. The VT100 family - with a variety of performance features at a variety of prices. And quality service - for end users and OEMs.

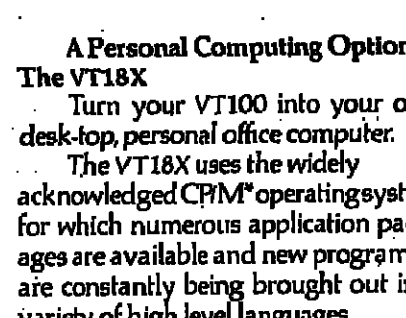
Affordable Business Graphics. The VT125 Graphics Option

If you already have a VT100, the VT125 Graphics Option offers the first really affordable graphics terminal for business people.

With a unique new graphics instruction set called ReGIS, you can instantly turn numbers into easily understandable pie diagrams, charts, bar graphs and curves. With simple but powerful commands and minimal demand on your CPU.



Enhanced text writing is also available to complement the graphics. And a colour monitor output is standard.



A Personal Computing Option. The VT18X

Turn your VT100 into your own desk-top, personal office computer. The VT18X uses the widely acknowledged CP/M operating system for which numerous application packages are available and new programs are constantly being brought out in a variety of high level languages.

Hard copy can be produced using the LA34-RA. And the whole package is backed by a full on-site maintenance programme that will set new standards in the computer industry.

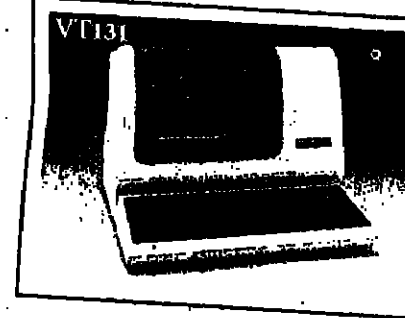
A New Economy Terminal. The VT101

The VT101 has all the well known features of the basic VT100 but at an economy price - designed for people who don't foresee the need to add a printer or to use the VT100's extra space and power.

Alternatively, you might consider the VT131

With the most popular VT100 options but again without expandability - the VT131 has an advanced video package with blinking characters, underlining, and a full 24 lines of 132 column characters. This package lets you maximise Digital's form handling and editing software.

The VT131 comes with printer port and five full and half-duplex protocols. And editing capability plus block mode transmission.



Then, of course, there's the VT100 itself

The most popular and widely emulated ASCII terminal ever built with enough power and room to support any kind of expanded capability you might need. It's perfect for OEM's developing demanding applications. Or for end-users who'll need the power for added options later on.

With 900 service professionals in the UK and Ireland, Digital can provide the personalised service you want. Only Digital has the expertise to offer you this combination of high quality products and low cost service.

Digital Authorised Terminal Distributors. Abacus Electronics PLC (Comma Div) Brentwood (0277) 811131.

Bytech Ltd. Reading (0734) 61031.

MBS Rentals Windsor (07535) 55211.

Rapid Recall Ltd. High Wycombe (0494) 26271.

Zygal Dynamics Bicester (08692) 3361.

Digital Equipment Co. Limited, Digital Park, Imperial Way, Reading Berks. RG2 0TR.

Tel: Reading (0734) 668711.

*CPM is a trademark of Digital Research Inc.

digital
We change the way the world thinks.

A milestone in hi-tech novels - it's plausible!

Feedback. Peter Niesewand. Granada Publishing. £7.95.

NOVELS that take computers seriously, without crediting them with superhuman intelligence and emotions, are rare. Add to such a book a hero who can discuss the relative merits of Algol and Fortran, a heavy dose of espionage, human drama, horror and a hint of romance and you have an inkling of the gripping story that Peter Niesewand has produced.

The year is 1983, and the US Defense Intelligence Agency has discovered that the Soviet Union has a bank of nuclear missiles aimed at strategic Western cities, and ready to fire. Since they are controlled by an IBM computer, the DIA decides to end in an expert to alter the programming at the Volgda base, a seemingly impregnable stronghold.

Niesewand explains the DIA's unlikely choice of fifty-eight year



PETER NIESEWAND... Gripping story.

old Professor Ross for the job by saying that no-one else has the right combination of technical ability and fluency in Russian, but it still seems a little contrived. It is, though, essential to the plot because, having trained the professor mentally and physically for his role, the DIA discovers that he is suffering from terminal cancer and has to face the dilemma of using his brain without his body.

What follows is a compulsive fast-moving tale that picks its way with surprising ease through a minefield of legal, moral and medical ethics, but is at no time completely implausible.

Research has been done meticulously, as one might expect from a journalist of Niesewand's calibre. His characters talk confidently and correctly about hardware and software, although the probability of anyone being able to reconstruct a program consisting of modules

BCPL text should be essential for systems programmers

BCPL - The Language and Its Compiler. Martin Richards and Colin Whitby-Stevens. Cambridge University Press, 1982. Paperback. £4.95.

THE BCPL novice, the established user, the language implementer and the student of compiler writing are the four categories of readership for which this excellent text is devised.

The text is concise, well written and well presented and makes a welcome appearance in paperback form.

BCPL has a wide variety of systems programming applications and the first three chapters introduce the potential user of BCPL to the language philosophy, main features and advanced features.

Chapters 4 and 5 cover the library, language extensions, debugging and error handling. These will be of particular benefit to the experienced user since previously much of their content has only been available as a kind of folklore.

Useful material on compiling techniques and compiler portability, not only for BCPL, form the next two chapters, and the final language definitions complete the book.

A clear enunciation of the BCPL philosophy and examples of good programming style pervade the text. These, together with the price, make it very attractive as a course text and several chapters include exercises of varying difficulty (but no solutions).

It would possibly have been interesting to have included some illustrative applications other than the slightly incestuous BCPL compiler written in BCPL.

However, overall the intended readership should be well satisfied and a wider audience can be motivated to the extent that it should be regarded as essential reading for anyone genuinely interested in systems programming.

Tony Powell

Head of Computing & Mathematical Sciences Department, Wolverhampton Polytechnic.

Technical standards microfile

TECHNICAL Indexes has launched a microfile of the technical standards for computers and communications technology to coincide with the start of Information Technology Year. It is aimed at those involved in the design, development and manufacture of computer and communications systems and equipment.

The standards are provided by Technical Indexes either in compact microfilm cartridges or on microfiches housed in two binders with a microfiche reader. As well as comprehensive indexing by number and subject, the file is updated by Technical Indexes every six months, incorporating all new and amended documents.

The standards included at launch are the CCITT (International Telegraph and Telephone Consultative Committee) Recommendations, the ECMA (European Computer Manufacturers Association) Standards and the relevant ANSI (American National Standards Institute) documents.

The Computer and Communications Technology file extends the



Technical Indexes' microfile of technical standards.

range of information services from Technical Indexes, which provides international standards and regulations on microfilm.

These include files of EEC technical legislation, German (DIN) standards, International (ISO) standards, NATO Standards and Export Requirements.

Technical Indexes Ltd (CW), Willoughby Road, Bracknell, Berks RG12 4DW. Tel: Bracknell (0344) 26311.

Recovery centre for mini users

RECOVERY Operation Centres, the portable disaster recovery centre specialist, has made a new facility available for users of minicomputer-based data processing systems and mainframe users employing distributed minis.

Until recently, the company has geared the design and provision of portable disaster recovery centres to large-scale computer users, providing the necessary air conditioning, power distribution and raised floor facilities required to enable mainframe users that have lost the use of their computer centre to recover from the disaster as quickly as possible. This type of service is now available for minicomputer users.

The cost of the service depends on the size of the Mini-ROC required, although as a guide the standard 528 sq foot unit costs approximately the equivalent of £7 a week.

Recovery Operation Centres (CW), 7 Mount Park Road, London W5 2RP. Tel: 01-991 0277.

NCR aims 'easy to use' terminal at the finance market

A FINANCIAL terminal which can be programmed in Basic is available from NCR. The 2262 Financial Teller Terminal allows banks, building societies and other financial organisations to introduce systems handling financial transactions.

The 2262 consists of a keyboard with 44 keys which can be programmed to handle different functions, a screen with 16 40-character lines, plus a journal printer, all in a single, extremely compact unit. Control electronics include 64 Kbytes of random access memory.

Hardware options include a magnetic stripe reader for entering information from plastic cards, a keypad for customers to enter personal identification numbers, a passbook printer, a digital cassette tape recorder for storing and loading programs and collecting transaction data and a currency dispenser which can accommodate a maximum of six denominations and can be shared by two tellers.

The passbook printer can be shared by up to four NCR 2262s, while a single 262 can concentrate data from 12 devices.

A variety of communications protocols are supported for online connection to a computer. The cassette tape unit option means the 2262 can also work offline as a self-contained transaction handling terminal, perhaps transmitting data from the cassette at the end of the day to a computer.

It can be programmed in NCR Basic+, which enables the user to tailor the terminal to his precise needs using his own staff, or alternatively NCR can provide a complete systems and programming service.

Standard program packages are available for the 2262 from NCR to help users introduce live systems even more quickly. They include systems to handle most teller functions, including foreign exchange.

It costs £2,280 in single units. NCR (CW), 206 Marylebone Road, London NW1 6LY.

Announcing...

COMPEC SCOTLAND

... Scotland's own professional computer show.

The highly successful Compec exhibition of computers, systems, peripherals and software is to be held in Scotland for the first time this year.

Compec Scotland in Glasgow between September 7-9, 1982 will allow companies selling into this important market to focus on computer users throughout the country.

Surveys of visitors to computer exhibitions demonstrate that users prefer to attend a show which is local to them. Compec North was enthusiastically welcomed in Manchester last year, and has expanded for the 1982 event in June.

Now Compec Scotland with a venue in the centre of Glasgow ensures a place at the heart of another key market.

For information about exhibiting at Compec Scotland contact Chris Timmins, Executive Director, IPC Exhibitions on 01-643 8040 Ext 4869. Or clip the coupon.

Another successful Computer Weekly show.

Please send me details of exhibiting at Compec Scotland.

Name _____
Job title _____
Company _____
Address _____
Signed _____ Date _____

Return to: Chris Timmins, Executive Director, IPC Exhibitions, Surrey House, Throley Way, Sutton, Surrey SM1 4QG.

Suits correspondence or flexi-study course

30-Hour Basic. Clive Prigmore. National Extension College Correspondence Texts. Prepared for The Computer Programme on BBC Television.

THIS beginner's manual is unusual in that it actually gives an estimate of the time needed to complete the course. The student can study on his own, use the book as the basis of a flexi-study course, or enrol as a National Extension College correspondence student.

Access to a computer is not a necessity but has obvious advantages, particularly for a student working alone. Most of the course will run on any microcomputer and the form of Basic used has been chosen to suit the majority.

The aim of the course is to teach the Basic language and sufficient programming skills to use it well. It covers the essential points of the language but makes no attempt to be a comprehensive study. A second stage will be available shortly.

Instruction is given in nine sub-divided units on simple statements, decisions, strings, lists, strings and printing, games, numbers, data processing and file handling. Unit one makes an encouraging introduction, for while fifteen subjects are covered, the pace is easy and both explanations and diagrams are admirably clear.

A similar step-by-step approach with visual explanation is used throughout, and the use of green print for significant vocabulary and statements and for certain margin notes aids clarity.

Examples are used to illustrate new points and there are opportunities for those with computers to key in problems themselves. Students can test their understanding at each stage by doing the quick self-assessment questions and the longer exercises, the answers for both being at the end of the unit.

For those with the advantage of tutors, the assignments, for which there are no answers, will provide further practice.

This book will make an excellent introduction to Basic for any student.

Rosemary Shephard
Freelance Journalist

Hobbyists' questions get logical answers

Microprocessors: Your Questions Answered. Alec Wood. Newnes Technical Books (Buckingham). 155pp.

THE previous book in the Newnes Microcomputer Book series, "Practical Microcomputer Systems", left a few technical questions unanswered. This book, however, is aimed more at the newcomer to the industry or first time computer student.

The question-and-answer format covers such major areas as silicon chips, hardware, software, logic and programming techniques. Typical questions are "What microprocessors are likely to come across?", "What is meant by interrupt?", and "What is meant by static, dynamic and volatile memories?"

Just about the only question not posed is "How do I get into computing?"

In fact, it is not long before some of the questions themselves are in need of some sub-questions. By page six, we are being asked: "What are TTL, NMOS, PMOS and CMOS? Only those

Ethernet controller for S-100 based systems

THE LRT Filabyte 2.0 Ethernet controller from Slntron Electronics provides connection to Ethernet for any S-100/IBEE 696-based computer using any Ethernet compatible transceiver, the company claims.

The design eliminates any overhead on the S-100 bus associated with processing Ethernet packet data at 10 Mbs. The controller provides buffer management, address recognition, backoff generation and error detection under hardware control.

Consisting of two standard S-100 cards containing state machine control logic, Serdes logic and CRC generation, the controller offers 1664K of buffer memory, which may be swapped a packet at a time to any 2K window in the S-100 addressing space.

Unused memory is available for use by the system for data or program storage, while packets may be processed directly from the buffer memory or transferred to main memory.

The controller may be used in a polled or interrupt mode. Interrupts are provided for Packets Available, Transmission Complete, Transmission Error, and Multi-cast Packet Available conditions. No overhead is imposed on the system unless information specifically addressed to the station has been processed.

The hardware and CPM driver fully support the ISO layer 0 and 1 (physical and data link). Complete CPM support for Xerox Ethernet protocols (ISO layers two to six) will be available soon.

Slntron Electronics (CW), 14 Arkwright Road, Reading, Berks. Tel: (0734) 85444.

Network test set is portable

A PORTABLE audio transmission test set for fault-finding and measurement on data lines for computer networks is available from David Bisset. The Electrodata Audio Test Set, model ATS-1, has an audio signal generator, frequency measurement and accurate level measurement facilities, and is housed in a pocket-sized case.

It is battery-operated and will isolate faults and make measurements on the leased line or "dial-up" lines that link two computer sites. It measures the rise and quality of a line, monitors noisy lines (it has a built-in speaker) and measures the receive and transmit levels of a modem.

ATS-1 measures signal levels between plus 6dBm and minus 50dBm to an accuracy of 1/2dB says David Bisset, and measures level and frequency (250 Hz to 4000 Hz) on a 4-digit display.

David Bisset (CW), 52 Luton Lane, Redbourn, Herts AL3 7PY. Tel: (058285) 2637.

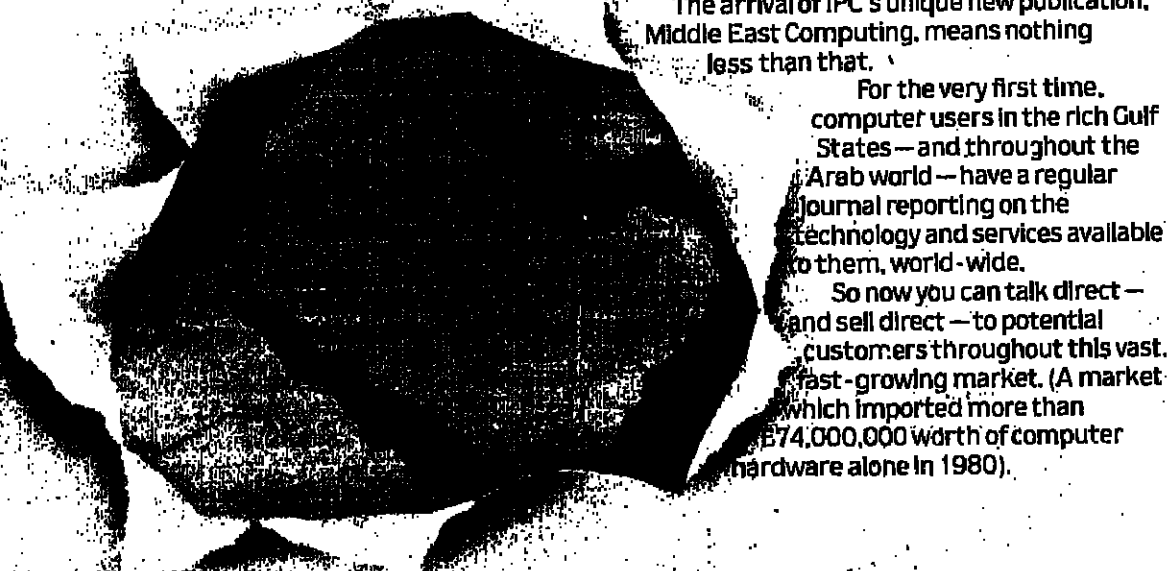
CRT for office equipment

A FOURTEEN-inch super high-resolution colour display (tube, with a 0.2mm pitch shadowmask) has been introduced by NEC Electronics (UK). Intended for automated office equipment applications, it is capable of a 6,300 alphanumeric character display.

Horizontal resolution has been boosted from 700/800 to more than 1,100 pixels with displays on 250mm x 180mm of the screen giving 1,120 pixels (horizontal) by 806 pixels (vertical). This is equivalent to 124 characters (horizontal) by 53 lines (vertical); a total of 6,572 characters each consisting of 7 by 9 pixels, says NEC.

NEC (CW), 116 Stevenston Street, New Stevenston, Motherwell ML1 4LT, Scotland. Tel: (0698) 732221.

We've opened up the Gulf!



How we've done it

Middle East Computing began as a single-issue publication, backing the Gulf Computer Exhibition and Conference at Dubai last December. Its enormous success revealed such an urgent and widespread demand for computer product information that it will be published regularly from April.

6000 copies will be sent to established computer users or key personnel within government and major business organisations in the Middle East countries predominant in the computer market. The circulation was compiled through the full research resources of Computer Weekly and IPC Business Press backed by contacts made at the Gulf Computer Exhibition.

Middle East COMPUTING

IPC Electrical-Electronic Press Ltd
A Computer Weekly publication
Advertisement Manager: David Hogan, Middle East Computing
Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS
Tel: 01-661 3500 Ext. 1537

Colour monitor range

A RANGE of high-resolution colour monitors for OEM graphics applications has been introduced by Aydin Controls. Known as the Patriot Series, the new range of in-line gun monitors includes the Model 8810 with a 13-inch display and the Model 8830 with a 19-inch display, and supplements Aydin's established family of delta and in-line gun models.

The Patriot series offers high video bandwidth, wide horizontal line rates, fixed convergence, excellent high-voltage regulation, modular construction, and the ability to accept analogue or TTL inputs.

Options include long-persistence phosphor tubes and neutral density filters. The monitors are available with or without cabinets. Deliveries of the new monitors will begin early in 1982, and discounts are available for quantity purchases.

Aydin Controls/Vector UK (CW), 1 Hunting Gate, Hitchin, Herts. SG4 0TJ. Tel: (0462) 58804.

Drawings filmed, filed and retrieved 'within seconds'

A MICROFILMING and information retrieval system introduced by Mitek of Slough, will "revolutionise" the use of microfilm, overcoming the traditional problems of different formats, accurate re-enlargements from film formats and fast, efficient retrieval, says the manufacturer.

Drawings and documentation of different sizes from A0 to A4 can be filmed on to the same fiche, filed and retrieved automatically within a few seconds.

The Mitek system comprises an SVK and a UKM camera, manufactured in West Germany. The SVK conversion camera solves the historical and archival problems because it has always been difficult to standardise on one microfilm format. Therefore users often have documentation and drawings stored on a number of different types of microfilm, namely half-plate, 105mm, 70mm, 35mm, or 16mm roll film, 35mm aperture cards or fiche. With the use of the

SVK conversion camera it is now possible for essential information which is stored on the different film formats to be converted to one type making it much easier for filing and distribution worldwide.

Colour transparencies can also be filmed or reduced to 16 or 35mm film or microfilm.

The UKM roll film and step and repeat camera handles current microfilming problems. This camera can film drawings up to 60mm x 40mm or A4 documentation on to the same fiche using reduction ratios up to 70 times.

The UKM camera also has an interchangeable copy table so that it can be used not only for filming plans but also documents, operating manuals, technical handbooks, journals, newspapers, bound volumes and industrial X-rays.

Mitek Micrographic and Reprographic Systems (CW), 828 Yeovil Road, Slough Trading Estate, Slough, Berks. Tel Slough 76411.



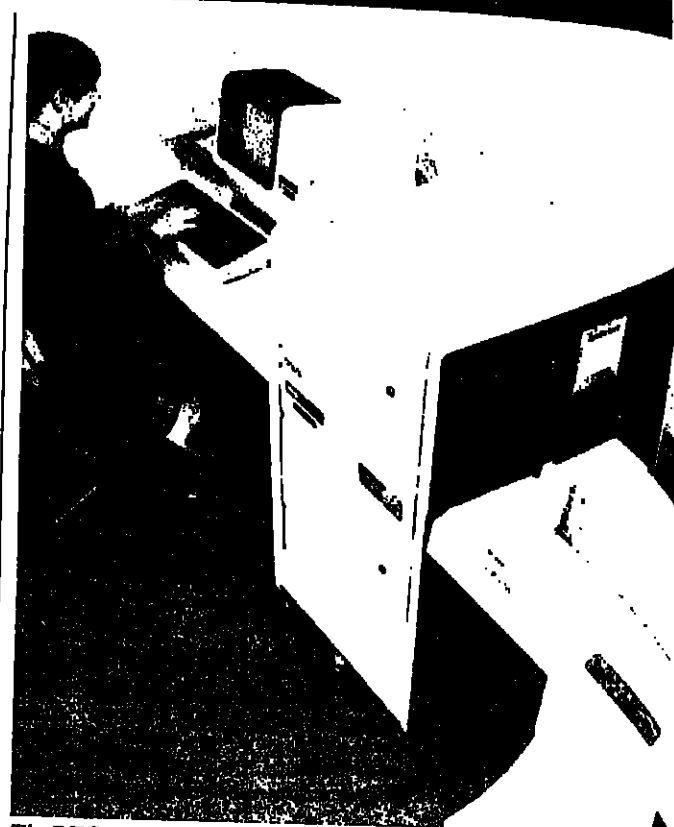
The Pericom 6809.

Multi-paging terminal

THE multi-page version of the Pericom 6809 visual display terminal allows examination and editing of several pages of text without being lost on forward scroll.

This option is valuable where reports or documents extend to several pages because the whole report can be studied on the screen going backwards and forwards as and when required.

Pericom Data Systems (CW), 1, Burners Lane, Kiln Farm Industrial Estate, Milton Keynes, Bucks. Tel: (0908) 564747.



The DEC mini package from Alvernic.

Powerful mini package for first-timers

A LOW-COST and fully upgradeable DEC minicomputer package aimed at the first-time user has been announced by Alvernic, one of the first authorised distributors to be appointed under DEC's new scheme.

For an inclusive price of £16,950, the user is said to get all hardware and software needed to establish computerised sales, purchase, nominal ledger, invoicing, stock control and payroll systems for his business, a three-month software warranty plus a year's free hardware maintenance. Delivery and set-up, a day's machine instruction and complete user manuals are also included.

Says Alan Coates, managing director, "This new package meets competing systems head-on, with the significant advantage of offering an expandable, fully proven system from an authorised DEC distributor. The result is a

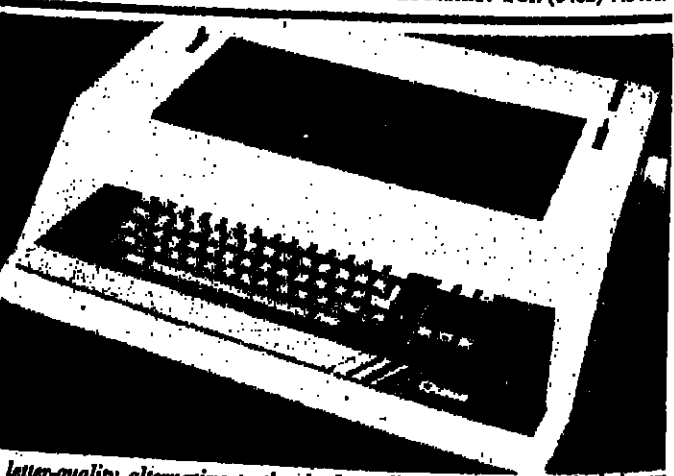
powerful package with a minimum of user risk."

The starter package comes at a cost some 30% below the normal price of the component parts - a DEC 336 Datasystem - says Alvernic. In effect, the standard software packages are being offered free.

Coates emphasises that, unlike some other low-price kits, Alvernic's is a real time, multi-terminal package using a proven and powerful operating system - DEC's Commercial Transaction System (CTS)-300. This provides fast response times and operation of up to eight terminals to cope with system growth.

Looking further ahead, the user has an upgrade path that will allow him to continue with his programs throughout the DEC range.

Alvernic Computer Systems (CW), Ryde Avenue, Hull, N. Humberside. Tel: (0482) 445461.



A letter-quality alternative to the draft quality interactive terminals is now available from Qume. Featuring the new MicroDrive print mechanism, the Sprint 935 daisywheel data terminal, seen here, can be supplied as keyboard send-receive or receive only units.

High-speed printing

THE microprocessor controlled 1200 Series Chitin Train from Digital Associates is said to offer high-speed printing for heavy duty applications, plus superior print quality.

The 1200 Series offers four print speeds: 600, 900, 1000 and 1200 lpm with a standard 64 character set. The Series has many standard features which are optional or unavailable on other printers, including an electrical horizontal fine form adjustment, two sets of motorised tractors, a diagnostic panel, self test feature and an automatic vacuum cleaner system.

Digital Associates (CW), 1039 E. Main Street, Stamford, Connecticut 06902. Tel: (860) 243-2054.

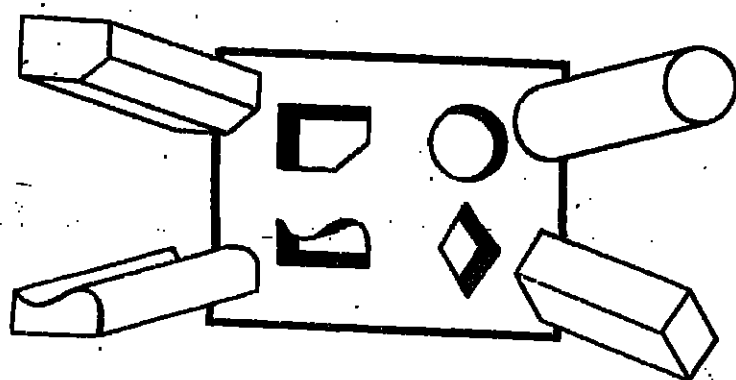
Micropad for IBM users

CONTINUING development work on the Micropad hand print data entry terminal has led to it being made available for IBM system users with 3270 BSC protocol. The interface has been achieved by an intelligent controller which can accommodate up to nine Micropads and an optional printer or console. Alternatively, the user may specify a combination of Micropads and other terminals.

The controller is available for immediate delivery and the price of a full nine-pad system is about £17,500. SDLC protocol will be released later this year.

Quest Group (CW), Quest House, Princes Road, Ferndown, Dorset, BH22 9HQ. Tel: 0202 871498 Telex: 41358.

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A major reason for the development of costly and inflexible computer systems is the failure to describe the business, its data and how it operates. The Data Analysis methodology is a means of understanding what the business does independently of any consideration of the systems which may be used to computerise parts of it, and for analysing its data independently of the applications to which it may be put.

First published as a major series in Computer Weekly, Data Analysis was written by Rosemary Rock-Evans and based on a methodology developed by Ian Palmer. Now reprinted in book form and fully illustrated, it is available from Computer Weekly. Simply complete the coupon below.

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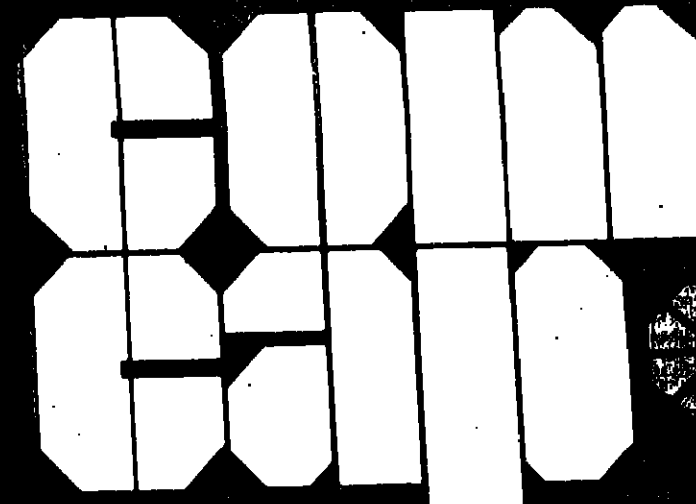
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Successful candidates may look forward to enhancing their career prospects, gaining valuable experience in an international environment.

Interviews will take place in London at the beginning of May. If you are interested in this opportunity, please send copy of your C.V. to the address for further details.

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Systems Programmers, Los Angeles, c£32k
Our client is located in the centre of Los Angeles. Their software environment includes IMS DB/DC, RACF, TSO, ACF, VTAM, and SNA, and future plans involve 2 x 3081 and MVS extended. Their requirement is for Systems Programmers who have MVS or CICS as a speciality.

IMS Programmers, California, c£32k
IMS DB/DC Programmers with Assembler and COBOL have an excellent opportunity to work on the Pacific Seaboard in California for 12 months. Our client is located at Marina Del Rey - a superb recreational area - and is developing an exceptionally sophisticated and fully comprehensive Life Assurance Package built upon an on-line database system under IMS DB/DC.

Systems Programmers, Chicago, c£34k
Two Systems Programmers with 2-3 years' experience are required by our client in Chicago. Solid IBM systems programming experience in a heavy on-line environment will meet one requirement and OS or MVS IMS DB/DC is required for the other position. Both assignments are for 12 months.



The Middle East

Assignments

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Appointments

NCR NEAT3 COBOL Programmer Analyst, KUWAIT, £350 pw
UNIVAC 1100 DMS 1100 Software Consultant, TRAC, £24,000 pa
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The persons appointed will be expected to rise to the challenges presented to them and to be capable of accepting a major part of the responsibility for development work. Typical projects include the development and installation of centralised and distributed communication systems, supporting Voice Response, POS, Viewdata, PSS/X25 etc.

Whilst attitude and the ability to work in a small team are undoubtedly the most important prerequisites, it is envisaged that the successful candidates will have been educated to degree level. They must have a minimum of three years' relevant post-graduate experience, involving a considerable amount of low level programming on mini or micro-computers. Any knowledge of PDP-11s and RSX-11 would be of interest, as would IBM communications experience or technical systems analysis skills.

For further information please contact Myriad at Reading, quoting Reference RT1/0403/CW

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The success of this new venture will require the construction of an effective and technically proficient DP team, and the appointment of a suitably qualified Systems Programmer is thus seen as crucial to the foundation of the service, and its future growth.

Initially, the successful candidate will take responsibility for the installation of an IBM 4331, establishing standards and developing the Operations team, as well as assisting with the development of on-line and Database technology for Insurance systems, utilising CICS and DL1.

Candidates will have a proven background in a DOS/VSE environment, and be adequately conversant with the installation and support of CICS and DL1 software, which will include all aspects of Network Design and Control, and technical performance monitoring.

The ability to contribute positively to the establishment and growth of a new installation is of paramount importance, and management ability must be apparent if the individual is to be relied upon to build the in-house technical resource as expansion demands.

To arrange an initial interview, call Rex Ashcroft or Andrew Carter on 01 935 0671 during working hours (24 hour answering service), or submit written career history to Rex Ashcroft at our London office if you prefer.

London 01-935 0671 James House, 46 James Street, London W1
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA
Brussels 010 322-640 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles
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Telephone or write to **Simon Lever**, Manager, The Netherlands, SCR International Limited, Amsterdam on 010 3120 760947 or 010 3129 723902 (evenings and weekends).

If you do not wish to make an overseas telephone call, telephone **Richard Champion**, SCR International Limited on: 021-236 3781 (24 hour answering service) who will arrange for you to be contacted in the evening.

Interviews will take place at SCR's London Office. Confidentiality is guaranteed.

Amsterdam 010 3120-760947 Willemsparkweg 92, 1071 H.M. Amsterdam
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You will have a minimum of three years' systems experience with a knowledge of commercial and financial applications and be capable of demonstrating both enthusiasm for and skill at solving user problems.

The Company's benefits package includes excellent salaries, a bonus scheme, contributory pension and substantial staff discounts.

To find out what lies beneath this surface information and to obtain a company profile contact David Eacott NOW on 061-491 1666 during office hours or Southport 211554 evenings and weekends.

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Sarawak Shell Berhad and Sabah Shell Petroleum Company Limited are major oil exploration and production companies operating offshore and onshore in the eastern states of Malaysia. A number of significant developments in their operations are in hand. They are seeking Malaysian citizens to fill senior positions in the Information and Computer Services Department based at Lutong, Sarawak.

Candidates should hold a degree or professional qualification and have a minimum of 4 years' relevant employment experience, or without a degree at least 8 years' such experience. Only those who satisfy these requirements will be considered, and candidates must be self-motivated and capable of working in this challenging and growing environment. The preferred age range is 30-35.

The Department operates a 4MB IBM 4341 supporting a local and remote on-line network for company locations in Sarawak and Sabah. Current IBM software includes DOS/VSE, DI/1, CICS, STAIRS, GDDM/PGP, and the main programming languages are Cobol, Fortran, Mark IV and Trans IV. A second IBM 4341 is being considered for installation late 1982 when VM with CMS/API will be introduced. Other computers include an intergraph (with PDP 11/70 CPU) using RSX11M-PIUS and IGDS/8, PDP11/34 using DSM11, PDP MINC using RT11, and IIP1000.

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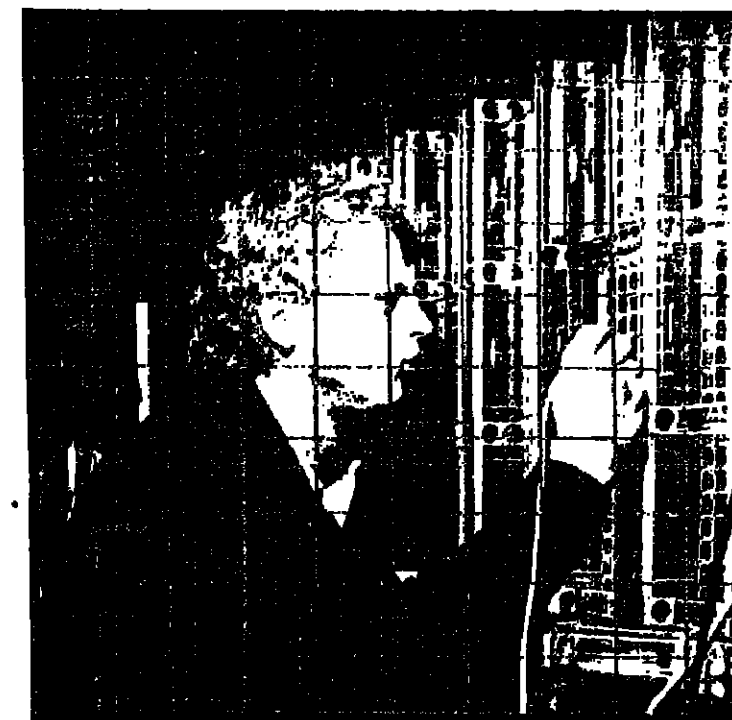
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DP at forefront of steady growth in job trends

by David Casey
QUOTING unemployment statistics as the key indicator of a region's economy is like taking a 10-second clip from a two-hour movie. The figure will provide no more than a superficial view of a complex scene, without casting any light on the underlying trends and conditions.

Nowhere would a false perspective of employment be more likely to result than in the Midlands - a loosely defined region whose economy has traditionally been dominated by heavy manufacturing industry.

Always an area heading the employment casualty league when industrial output declines, the Midlands is now providing an increasing range of job opportunities in the computer sector.

Computer-related activities are inevitably at the forefront of the growth, being detected across an area of the UK stretching from Worcestershire in the South to the lower limits of Merseyside. Moving East through the Birmingham conurbation, the steady improvement in employment trends is being felt as far away as Lincolnshire and Cambridgeshire.

In relation to the surge in employment experienced

during the late 1970s, however, the number of new posts being created in computing is relatively small. But in the context of the most severe period of recession since the 1930s, the trends are encouraging.

Employment consultants and agents playing their trade across the Midlands recognise the precarious state of the employment market. Companies are still in the process of becoming leaner and hungrier before they can embark on a longer term strategy of controlled expansion.

Mike Bedingham of Birmingham consultant M.K. Associates accepts that there is a lack of fluidity in the job market, but sees the problem lying as much with the candidate as with the employer. "There is a lack of people with the right kind of experience prepared to move between companies," he says.

"The threat of redundancy has been a major influence on staff mobility in the Midlands throughout the crisis. The substantial redundancy entitlements that would be earned after a career of perhaps five years with one employer would be lost in a transfer. On the other side of the coin, the last-in first-out approach makes the new employment

even more vulnerable." Accepting that the majority of recruitment is designed to replace existing members of staff, Bedingham maintains that employers could do more to stimulate a higher calibre of candidate: "In general, companies do not look outside their own marketplace in filling vacancies. I do not believe, for example, that the only people capable of selling computers are those who are already in this field."

"There is experience to be drawn in from related product areas. If more re-

I do not believe that the only people capable of selling computers are those who are already in this field

sources were invested in training, there would be a broader spectrum of candidates," he adds.

The view that employers could "cross-fertilise" vacancies was shared by Mike Hessian of S.R. Recruitment. When clients provide him with a broad job specification, there is usually little difficulty in finding a suitable person to fill the job.

He takes the example of a



Cambridge is feeling the improvement in employment trends. Pictured is St John's College.

junior analyst. "This post could be filled by a senior programmer wanting to move up the ladder, or by someone from outside the computer industry with a relevant business background," he says.

"The problems start when an employer wants to

towns like Northampton, Banbury, Stafford and Stoke-on-Trent than in the heart of Birmingham.

The reasons for the disparity are structural, he believes. "Organisations in the major industrial centres are large manufacturers, while the outlying regions have a higher concentration of smaller companies in service and development activities. Expansion after the recession is more rapid in firms which are less dependent on heavy manufacturing."

Lee Walkinshaw is managing director of Computer People Midlands. He believes that the improvement in the market for first and second house purchases should help match suitable candidates to vacancies. "In our experience, employers can be supercritical over appointments, to the extent that they are unlikely to recruit the person they actually need," he says.

"But we find that there are a lot of rejections from

candidates who are accepted for posts yet decline because of the relocation involved. The ability to sell a home should prove a positive influence.

Relocation expenses have a bearing on mobility within the Midlands. While attractive vacancies may exist in the more rural parts of the region, staff are unwilling to stand the cost of moving home.

Hessian attempted to quantify employers' attitudes towards this thorny issue: "The majority of large companies pay relocation expenses as a matter of course, but these are not generally the firms with the vacancies."

"Medium-size employers may cover the cost under protest, but the software houses and computer consultancies providing the greatest number of job opportunities resist the additional expense." He sees this as an unsatisfactory response.

Whether moving from the

London area to the Midlands could have an adverse effect on longer term prospects was a question taken up by Don Kemp, managing director of recruitment consultancy McDowell Knapton. "Many of the people we are recruiting from the South are coming here to advance their career," he notes.

"While I would agree that only a minority of processing development is taking place in the region, there is considerable opportunity for appointment in DP management and computer applications within Midlands industrial companies."

A similar bias towards staff with experience of process control, or any form of real time application on minicomputers and above was noted by Digby Dyle, manager of Staveley Computing in Worcester. Any from the heavy industrial centres of Birmingham and West Bromwich, the employers he is serving at predominantly scientific and electronic engineering firms. Financial institutions are now forming part of Staveley's client base.

With a permanent crew approaching 200, and a further 150 contract staff assigned to Midlands sites, Security Computing of Birmingham is ideally placed to monitor trends in the region's economy. Barry Fisher, the company's management services manager, sees contract personnel playing a crucial role in a firm's recovery after the recession.

To claim that a background in computing is Open Sesame to employment in the Midlands would be wholly unrealistic. But for staff able to provide expertise in production-related areas, the prospects are good.

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For an application form please write or telephone the Personnel Services Manager, J. W. Thornton Ltd., Derwent Street, Belper, Derby DE9 1WP. Tel: Belper 4181.

Thorntons

(6762)

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Closing date for the receipt of applications is 18th March, 1982

(6843)

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Closing date: March 16

(6847)

ANALYST PROGRAMMERS

We are a highly successful company manufacturing precision engineered products for a world-wide market. We currently use an IBM System 34 with 13 terminals, a processor of 266K and 268MB disk capacity.

An IBM System 38 is currently under consideration. Existing applications cover financial and production systems with the emphasis on future developments being in the production areas.

Currently various System 34 packages are being analysed to determine their use in our future development programme.

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My client is a light engineering manufacturer in the forefront of its product field. They are seeking to recruit a Senior Systems Analyst to be responsible for the development of new applications and the maintenance of existing systems.

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Contact Mr. T. Davies, at SEGTA, 5 Church Green East, Redditch, Worcs.
Tel: Redditch 80890.

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c£10500

Eagle Computing Systems is an expanding Midlands based software house with a reputation for maintaining high standards of software and documentation on the IBM CBO range of machines.

They currently require Systems Analysts/RPG II Programmers with 2/3 years proven experience of RPG II/RPG III and thorough practical experience of IBM systems 34 or 38. You should have a professional approach to your work and a sound knowledge of small business systems. You will work with a good team on interesting and varied projects. The benefits include a salary of c£10500, paid overtime, family membership of BUPA, lunch allowance, telephone rental payment, bonus scheme together with company car and expenses.

Please apply in writing with full CV to S. G. Eagle, 278 Monument Road, Edgbaston, Birmingham B18 8XP.

Applications are invited from both men and women

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(Scp 31-36) (£8190-£9528 p.a.)

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Application forms and job descriptions may be obtained from the undersigned and be returned to him not later than Monday 22nd March 1982.

Canvassing of any of the members of the Council or Committee, directly or indirectly, for any appointment will disqualify the candidate concerned.

Applicants should also disclose any relationship to a member or Senior Officer of the Council.

J. D. Ellsey, Head of Personnel and Management Services, Carr Bank, Mansfield, Notts.

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c£8000

We are a leading retail chain, currently embarking upon a variety of projects using Database and TP techniques.

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£21000 + CAR (on quota - no upper limit)

Derby based Everts Computers Limited, a member of the Everts Group of Companies, is looking for additional experienced sales personnel. The company is active in both the commercial and industrial areas of computing and has a wide range of software packages, developed for the DEC PDP11 range of computers already installed with reference sites.

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Applications in writing to Mr G. J. Haseldine, Everts Computers Limited, 123-125 Great Lane, Derby DE1 1RZ.

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PROGRAMMERS

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PROGRAMMERS

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PROGRAMMER

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CPC

Continued from P27 (CW wouldn't give us a full page)

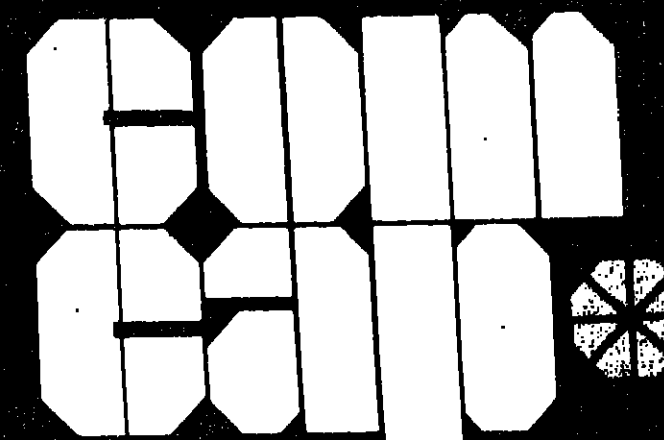
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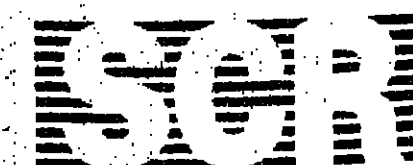
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Scientific

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International Company, with long established, broad customer base, is seeking to expand its first class sales team. Two Senior Sales Executives are required, with proven sales experience and business knowledge, to market their successful super-mini range.

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Vic Chivers

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For the Software Division of a Major Group. In addition to specialist technical skills, candidates should have broad business knowledge, covering for example, one of: Commercial, Scientific, Banking, Insurance, Defence, etc.

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For major Computer manufacturer, covering Communications, Compilers, Operating Systems, Database, Software Development and Software Support.

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S.W. MIDLANDS

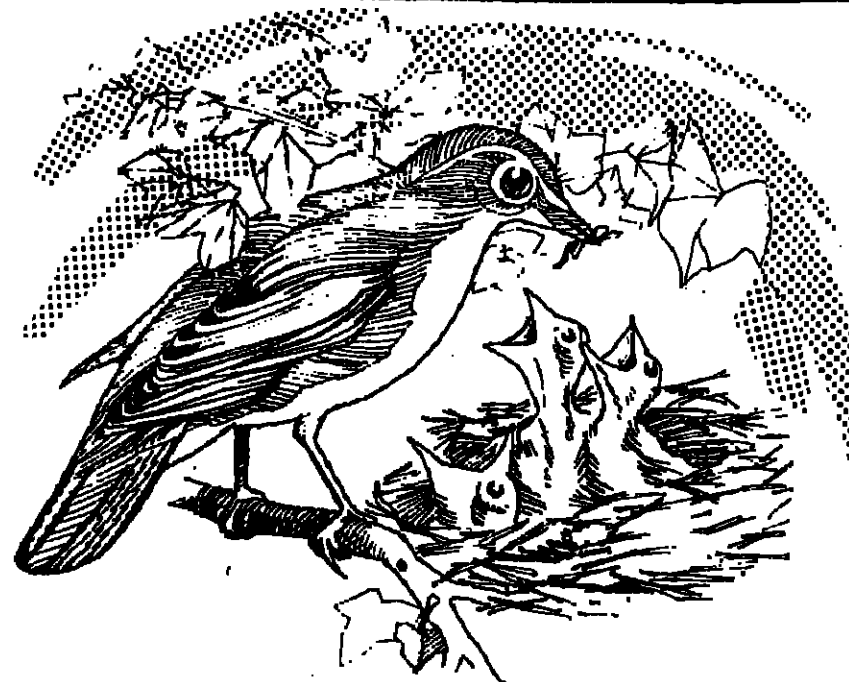
£13,000

For Financial systems development, dealing with Financial user divisions country wide. Candidates should have either an Accountancy qualification (A.C.C.A.), etc., or directly relevant experience.

Contact: Vic Chivers

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Support Staff

£6,587 - £7,715 p.a. and
£7,652 - £9,132 p.a.

London SE1

As a result of continuing growth in computer services we need to recruit 2 more staff in our Systems Support Group, based at the South Eastern Region Headquarters of the Central Electricity Generating Board. The group has three main disciplines:

- 1) Supporting centralised operating systems software on two ICL 2980 mainframes.
- 2) Installing and maintaining distributed software running on computers and terminals at major locations in the Region.
- 3) Planning the introduction of new applications into the Operations environment.

We operate VME/B; DME/George 3; Batch, MAC, RJE and TP on the mainframes; TME, TPS and Bulletin on ICL ME28s and a large support network of mini-computers, terminals and word processors. Continuing growth of computing will probably take us into new hardware regimes by the end of the year.

With all this we need assistance to support the extra workload generated by TP and distributed systems and can offer you the opportunity to develop your technical skills. There is a high level of job satisfaction through involvement with a group of people who want to provide a good service to users of the Computing Branch.

Applicants should have 'A' level in at least one of the sciences or an HNC. You will have to demonstrate your aptitude for this kind of work and be able to communicate clearly with both technicians and laymen. Mobility is important at senior levels so a driving licence is an advantage.

If you feel this is a job to match your ambition and potential then ring Derek Johnson on 01-261 2327 for further details, or write with full career and personal details to The Personnel Officer (Recruitment), CEGB (South Eastern Region), Bankside House, Sumner Street, London SE1, quoting Vacancy Number 102182/CW to arrive by 22 March 1982.



Central Electricity Generating Board
SE Region

SYSTEMS ANALYST

PROGRAMMERS
Cobol/Hewlett Packard/Applications exp

SENIOR SYSTEMS ANALYSTS
Masplac/pics, Engineering Background, IBM exp.

SALES EXECUTIVES
Packages/Micro/Peripherals

SENIOR SYSTEMS ANALYSTS
Commercial Experience

PROGRAMMERS & ANALYSTS
Data General/Perkin Elmer/DEC

TECHNICAL SUPPORT

SENIOR SYSTEMS PROGRAMMERS
DOS/CICS/Teleprocessing

PROJECT MANAGER
Commercial Experience

FIELD SERVICE ENGINEERS
Mainframe/Minis/Peripherals

PROGRAMMERS
Cobol/Assembler/IBM 3032

ANALYST
Visonix/Colbas

SOFTWARE ENGINEERS
Fortran/Pascal

ANALYSTS
2 years' experience + RPG 11

CONSULTANTS
Banking/Insurance

SENIOR PROJECT ENGINEER
Peripherals/Industrial contracts

PROGRAMMERS
Cobol/IBM 3031/Commercial exp.

PROGRAMMERS
Cobol/Commercial

PROGRAMMERS
Basic + BASIC

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North Bucks.

to £13k

to £13k
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to £10k
Nationwide

to £10k
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Aston

to £12k
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to £15k
North London

to £9k
Leicestershire

to £13k
London

to £15k
South France

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South France

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Project Management

c. £12.5 - £15k

South Bucks

We're Moving into Information Technology - Fast!

Amersham International is a world-leader in the supply of sophisticated technical products to medicine, research and industry. Our continued growth has led to a major investment programme in Corporate Information Services.

Two senior Project Managers are now required to take charge of vital development projects.

Management Information System

The system aims to give managers improved information to help them to run the business and will be the first stage in the Company's proposed Information Centre. It will use an open-ended approach to developing corporate information resources based on linked mainframe and mini computers.

On-Line Order Processing System

This is the key element in maintaining our market competitiveness. The Order Processing system will need to support same-day despatch of short-life products to overseas customers and generate critical information for production and marketing activities.

Both projects present exciting challenges for the right candidates who must have:

- advanced Project Management skills gained on large projects
- awareness of the commercial implications of such projects in a competitive environment
- substantial experience to realise an integrated company data base
- a strong background in distributed processing (the present network is based on ICL and HP equipment)

The company offers an attractive and stimulating environment with excellent conditions (including relocation help where needed). These appointments are open to men and women.

If you feel that you have the experience and drive required, please telephone Little Chalfont (02404) 4444 Ext 3569 or write with full career details to P. L. Jones, Personnel Manager, at the address below:

Amersham International plc

White Lion Road Amersham

Buckinghamshire HP7 9LL

Amersham

SALES EXECUTIVES

Recruitment and Contract Consultancy

London & Brussels

£15000 - £30000

Established seven years ago, Datascene is one of the leading companies in providing Advertising Recruitment and Contract Services. In a planned expansion programme we have just opened a branch office in the centre of Brussels to expand our operations in Europe. Further plans are envisaged to open further branches in the near future.

We are currently looking for four to five members to join our highly successful team with the following background:

- A proven track record as sales executives in the computer services field.
- Aged over 25 with a good educational background.
- The ability to communicate at all levels.
- To communicate in French, verbally and in writing (for Brussels position).

We offer high basic salaries, an incentive commission which includes an initial guarantee, PPP medical insurance and Company car. Incomes can vary from £15000 to £30000 dependent on success.

For further information please contact Mike Oakes.

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Targa

SURREY

PROGRAMMERS

TO £11,000

Our Clients require a number of good IBM COBOL programmers for their Commercial Applications Group. They are able to offer candidates with upwards of 18 months experience opportunities for career development but would also be interested in people with previous exposure to leading more junior staff. A leading manufacturing concern, the company is able to offer superb office accommodation and an excellent benefits package that includes assistance with house purchase in some cases.

Ref. B3582

W. LONDON

SENIOR PROGRAMMER

£11,000 + Mortgage

A subsidiary of a major American Banking Corporation require a senior programmer to join their very active systems group. A commercial background including the use of any high-level language such as COBOL, PL/I or FORTRAN is necessary in order to assist development of an on-line system catering for the credit facilities offered by a number of well known retail outlets. Usual banking benefits including MORTGAGE are offered.

Ref. B3849

CENTRAL LONDON

ANALYSTS AND PROGRAMMERS

£8,000 to £13,000

RPG I or RPG III Programmers and Analyst Programmers are needed by a leading Software House that specialises in systems based on the IBM S34 and S38. This company are looking for bright, personable people with the right technical background and offer quick advancement and excellent fringe benefits including paid overtime, BUPA, annual profit related bonus and all travelling expenses.

Ref. B.3259

KENT

SENIOR PROGRAMMER

c. £10,000

A Senior Programmer with around four years COBOL experience including IBM IMS exposure is required for our clients, an internationally known company based in Kent. Developing applications such as inventory control, Payroll and forecasting this organisation are also looking for a PROGRAMMER with around 2 years experience and offer an excellent benefits package including relocation.

Ref. R3809

CITY ANALYST/PROGRAMMER

TO £10,000 + MORTGAGE

A leading City Merchant Bank has a requirement in one of its subsidiaries for an experienced COBOL Analyst/Programmer. Self-motivation and the ability to lead a small but growing team, together with the personality to liaise with non-technical staff at all levels is desired. Excellent career prospects are offered by this ground-floor opportunity.

Ref. RC3658

E. LONDON

ANALYST PROGRAMMERS

c. £12,000 PACKAGE

There are opportunities within a highly successful company operating in the financial sector for Analyst Programmers. Strong IBM COBOL or ASSEMBLER is required, preferably with a knowledge of the second language. Applications are developed in a DOS/VSE environment using CICS and exposure to this software would be advantageous but not essential. First class conditions of employment and benefits package are offered.

Ref. R3673

CITY ANALYST/PROGRAMMER

TO £12,000 + MORTGAGE

Expansion of a major international Bank's EDP team affords an exciting opportunity for Analyst/Programmers with at least 3 years experience in banking, financial or commercial applications. The work involves implementation and development of systems, both in the UK and abroad on PDP11 and VAX machines, therefore a background which includes Basic or a similar type language working with large 'mini' computers is desirable.

Ref. C3816

CITY SYSTEMS ANALYSTS

TO £11,500 + MORTGAGE

Two of our clients, both in the insurance industry, have requirements for Analysts at differing levels. For the senior post at least 4 years analysis and systems design within an ICL environment is required, the second position's requirement is for 2 years plus analysis with ICL VME knowledge. In both cases a financial applications background is desirable. These positions carry very attractive benefits packages which include Mortgage subsidies and Bonus schemes.

Ref. C3814

CITY ANALYST/PROGRAMMERS

£8,000 - £12,000

Vacancies occur at various levels for persons with good BASIC, BASIC + FORTRAN or similar programming backgrounds to join a rapidly expanding Systems House and Consultancy. Excellent careers are available in either development of support roles working with Banking Systems, Data Communications or Message Switching applications in London and abroad. An attractive salary range, reviewed at 6 monthly intervals is supplemented by a generous company benefits package.

Ref. C3488

ESSEX/HERTS

PROGRAMMERS

c. £9,500

Our Client, heavily committed to the implementation of new systems involving manufacturing and associated applications, has a requirement for Programmers and Senior Programmers for their development team. A sound ICL COBOL background is desired, with knowledge of FILETAG, a distinct advantage. As well as an excellent salary, related to experience, an exceptional benefits package applies, which can in certain circumstances include relocation.

Ref. C3399

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JBA**IBM Systems Software Specialists
Brussels Package c.£22,000**

Our client is a well known international "high technology" organisation. SOFTWARE SPECIALISTS are now being sought to assist in the development of new purpose built software tools to be used by their organisation throughout the world.

Applicants must be good technicians with experience of large IBM mainframe systems software or middleware, and the ability to conceive, design and develop new products. Candidates must also be "good communicators" willing to travel and have the personal qualities to secure co-operation from other people.

Contact: Bev Stevens in Birmingham

IBM GSD Consultants

£8,000 + Escort to £11,500 + 2 ltr Capri

An international software organisation specialising in IBM GSD support is seeking people of the right calibre to become consultants. Candidates should be familiar with RPG II and have sufficient experience with IBM System 3, 34 or 38. Length of GSD experience is unimportant because the main objective is to find "quality" people who can be successful in the computer service industry.

Contact: Bev Stevens in Birmingham

**IBM System 34 Analyst/Programmer
Near Cambridge c.£8,750**

An experienced RPG II Analyst/Programmer is urgently required to support our clients' System 34 installation based in Newmarket, Suffolk. Reporting to the Financial Director he/she will be responsible for the day to day management of the D.P. function, for maintaining and enhancing current systems and developing new systems as required. Applicants should have at least 1 years' relevant experience, preferably in an industrial environment (although not essential), and be self-motivated individuals. Relocation is available if appropriate.

Contact: Tony Staples in London

**JAMES BAKER ASSOCIATES
International Personnel Consultants**

32, Savile Row,
London W1X 1AG.
Tel: 01-439 9311

**Computer
Service Engineer
ON BURROUGHS EQUIPMENT
IN BERMUDA**

UP TO \$20,000 + STANDBY/OVERTIME

Our client company was established in Hamilton in 1920, enjoys a reputation for excellent service, and supplies Burroughs computers to many users on the island.

The new Engineer will join a small team of engineers specialising in the installation and maintenance of small to medium computers - predominantly the B90, B90 and B1700 to B1800 systems, tapes, disks and associated peripherals.

Candidates should have sound experience of working on these systems and their software in a data communications environment, with good knowledge of on-line terminal networks. Fully-trained, you must be capable of working alone once initial familiarisation is complete.

Bermuda is a semi-tropical island 800 miles east of North America, in the Gulf Stream ensuring a temperate climate with summer temperatures from May to November. The environment offers an attractive way of life with many leisure and sporting activities readily available. A single person is preferred, a married person without children would be considered, and the appointment is subject to the issue of an annual work permit.

Airfares and a relocation expense allowance will be paid, and in addition the company provide the attractive range of benefits one would expect from a well-established organisation. These include generous holidays, free life assurance, sick pay, pension scheme and insurance (some of which are free).

To apply, either send in your c.v., call in to our Central London Office or telephone, quoting reference W341-B.

Tel. 01-242 9356



**computer
personnel**

16 Bedford Row, London WC1R 4EJ

Analyst/Programmers

West London

to £11,000

Our client, a leading software house, is looking to increase their market growth considerably during the next twelve months. They wish to recruit Programmers and Analysts/Programmers from junior to senior level to join a wide variety of project teams whose assignments range from commercial to manufacturing systems.

The excellent promotion prospects are based entirely on merit and you will be given comprehensive training whenever necessary. These opportunities are open to applicants with a minimum of 1 years' IBM COBOL experience on OS or DOS systems.

Contact: Tony Cox in London

Management Opportunity

London

£Negotiable

Our client is a commodity trader based in the city of London, and part of an international merchant bank.

Recent installation of a mini computer has created the need for an experienced Analyst/Programmer with at least 3 years' COBOL to take full responsibility for systems development and technical support. An excellent salary will be paid together with a benefits package available only in a banking corporation.

Contact: Arthur Sandell in London

Analyst/Programmers

(mini computer applications)

London

neg to £11,000

Our client, a well established and expanding consultancy organisation is engaged in the development of new projects utilising WANG equipment. They are developing and marketing a range of applications software including financial, accounting and order processing systems. Analyst/Programmers and Programmers are required. Ideally with Wang, DEC, Honeywell or IBM minicomputer experience. Preferred languages are BASIC and/or COBOL but for candidates of the right calibre other languages or small machine experience is acceptable. A minimum of two years' systems/programming experience is required and good communicative skills are essential.

Contact: Margaret Stevens in London

Gateway House, 50 High Street,
Birmingham, B4 7SY.
Tel: 021-643 7865

PROJECT LEADER

c£12,000

London City

The Financial Times newspaper is in the process of computerising its accounting function on a PDP 11/70 configuration.

This has created an opening for an experienced Project Leader to control a small team of analysts and programmers in the analysis, design, implementation and modification of computer systems.

We are looking for a computing professional with good systems experience and preferably with a knowledge of accounting procedures, capable of managing all aspects of a project from feasibility through implementation and forward planning.

As there will be substantial involvement with user departments and their requirements, well-developed management and organisational skills are essential for this position.

Benefits include 5 weeks' holiday, company pension scheme, L.V.s and season ticket loan scheme.

Please write with full c.v. details or telephone for an application form to:

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PERSONNEL DEPARTMENT
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Tel: 236 9758

FINANCIAL TIMES

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OF THE EUROPEAN COMMUNITIES
JOINT RESEARCH CENTRE
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engages

**SENIOR SYSTEM
SOFTWARE MANAGER**

with a university degree

Responsible for the main system software of the calculation centre and in particular of the:

- optimal functioning of the software systems of the mainframe computer (AMDAHL 470/V8) as well as the communication processors (ITT 3805); □ the coordination of the work of a team of system analysts and system programmers the relationships with a team of Computer Operations, the User Support Group and groups of computer users, together with other computing centres and software companies; □ the planning and organisation of the installation of new system functions or system improvements.

Preference will be given to the candidate having these qualifications:

- several years of professional experience in the maintenance of the system software for large computing installations, possibly as head of a team; □ proven skill and experience in the management of technical experts.

SYSTEM PROGRAMMER

with education to "A-level" standard

He will participate, under the general instructions of the responsible for the Sector or a senior system programmer, in the installation and maintenance of the different operating systems in use at the Computing Centre.

Preference will be given to the candidate having these qualifications: □ additional education in informatics; □ good knowledge of the general structure of modern operating systems; □ experience in the maintenance of system software; □ the ability to work within a team. A thorough knowledge of one Community language and a satisfactory knowledge of one other Community language, are also required.

Recruitment criteria, based on the staff regulations and salary scale applicable to temporary agents of the European Communities:

Temporary contract, up to five years, with possibility of renewal - Salary according to age, qualifications and experience - Other benefits include family and expatriation allowances. Only nationals of the Community Member States may be considered for the above post.

Replies should be sent to the following address, together with a detailed curriculum vitae and copy of degree or diploma:

Joint Research Centre, Administration and Personnel Division, I-21020 ISPRA (VA), Italy, within two weeks of publication.

SOFTWARE SPECIALISTS

Back in 1957, the Digital story began as a three man and one logic module operation. Today, in our 25th year, we have grown rapidly to lead the world in the design, manufacture and marketing of interactive computer systems.

We are still enjoying tremendous growth in all areas of our worldwide organisation - and the software side of our UK operation is no exception. That's why we're now looking for at least four talented Software Specialists to join us in either Bristol or Basingstoke.

EXCITING CAREER AREAS IN...

For both locations, the common responsibility will be to provide a high level of software support to both new and existing customers. To be more specific, we need Software Specialists to join us in Basingstoke and Bristol to work in tandem with our sales team advising on the suitability of DEC products and assisting in demonstrations and installations. Software Specialists are also required at both locations to provide installation and post-sales support, and again in Basingstoke, another Software Specialist to work in our telephone support function analysing systems faults and advising our customers' software personnel.

To meet the many challenges of any one of these equally rewarding positions, you must be a mature and creative professional, aged 23-35 with a University or College education with more than 2 years' relevant experience - ideally gained on DEC operating systems or hardware. You'll also need a full driving licence and good all round communication skills. A successful background in either a product support or a pre-sales environment would be an advantage.

REGIONAL LOCATIONS FOR...

If you're one of the men or women we're looking for, you can expect excellent rewards with Digital. In all cases, we offer attractive initial salaries together with a full range of valuable fringe benefits - including relocation expenses, where appropriate. And as you would expect from an expanding international organisation, the career prospects for the determined and ambitious are excellent.

So if you're an ambitious Software Specialist looking for more challenge, more responsibility and better rewards, ring us NOW on one of these numbers below. Alternatively, please write with full personal and career details to Tim Padder at Digital Equipment Co. Limited, Wingrove House, Basing View, Basingstoke RG21 2UR. Ref: SW417.

VERY SUCCESSFUL ORGANISATION.

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For the post in Bristol, please ring Mike Jackson on Bristol (0272) 558201 during normal office hours.

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For the posts in Basingstoke, please ring George Jones on Basingstoke (0256) 58233 during normal office hours.

digital

**EMJAY
COMPUTER
SERVICES****SNR PROGRAMMER
COBOL**

£9,500
Do you have two years' solid programming experience using COBOL? Our client, in the field of finance, needs a senior programmer to look after the design through to implementation of various new projects which are in the analysis stage. CICS and PLI experience would be an asset, but our client would be prepared to TRAIN in CICS if necessary. This position provides a unique opportunity. There is also a good benefits package including flexi-time.

**BASIC +
ANALYSTS/SYSTEM
DESIGNER**

£11,000
This forward thinking company has assessed its future requirements, and wants two systems analysts to lead two new development teams. To qualify for these positions you must have at least one year's analysis experience in a commercial environment. A Systems Designer is also required with solid design and programming experience with a programming background.

PROGRAMMER to £11,500

This multinational organisation with offices in all the world capitals, are currently expanding their software development teams, and to this end they require RPLC programmers with a minimum of 2 years' experience, preferably in a financial environment. The successful applicants will receive an excellent remuneration package with an attractive benefits package which includes a hybridised house purchase scheme.

Call Harvey Kays or Lynda Abi

**PLI
PROGRAMMER c.£8,000**

Recruitment Not for this company. During the past two years' the volume of business and the profit has increased. To enable them to keep up with the demands made on their software teams, they require PLI programmers with a minimum of two years' experience. They have a large communications network, and for those successful applicants who have not had the exposure to Comm., full training will be given. There is a full range of fringe benefits including S.T.L. and a subsidised restaurant.

**FORTTRAN PROGRAMMER
to £12,000**

Are you a commercial FORTRAN programmer? Our clients, a financial services firm, require your expertise. You should have at least two years' FORTRAN on commercial applications, preferably with an American language, although this is not essential. This is an outstanding opportunity to move into a progressive environment where hard work is rewarded with promotion into analysis and management. The company offers good benefits coupled to an excellent starting salary. Interested? Of course you are. CALL US NOW.

PROGRAMMER c.£7,500

Do you know BASIC? If you have a programming experience using Basic 4, then this international company is for you. The hardware comprises two mid-range PCs using RSTBC. Applications are varied and they require a person who can handle all aspects of commercial applications. The company is offering an excellent salary, good promotion prospects and a very stimulating and progressive environment.

**COMPUTER SERVICES
Recruitment Consultants**

London
27 Chancery Lane, London W.C.2
01-242 0075 01-494 4336

**Systems Support
Manager**

Use your technical expertise and commercial flair to develop a remote access network

One of the country's most successful computer bureaux, our client is engaged in an ambitious strategy of investment-led new product development. Of key importance is their plan to develop an advanced remote access network based on large ICL 2900 mainframes with distributed processors at regional centres around the UK.

This exciting development is already well in hand and has now created an immediate need for an experienced Systems Support Manager to make a vital contribution towards its continued growth and success. The network provides an entirely new level of customer service and represents a considerable challenge to all involved.

Reporting direct to the Production Sector Manager and leading a high calibre support team, your responsibility in this important role will be to operating and production support. In addition, you will back up sales personnel in their dealings with customers and will therefore keep abreast of all the latest hardware developments.

The exceptional man or woman our client seeks will demonstrate a thorough knowledge of operating and communications systems based on at least ten years' good DP experience. A background in project management, preferably in a commercial environment, is highly desirable. A good all-round communicator, you must be strongly self-motivated with a high degree of business awareness.

The remuneration package consists of a competitive salary of around £13,000 p.a., depending on your qualifications and experience, participation in an attractive management bonus scheme, and a valuable range of large company benefits. And as a forward thinking organisation with an active policy of expansion they can offer you very real career progress.

So, if you have the flair to meet this exciting challenge, please write with full career and personal details, quoting ref: RW/389/CW to Richard Wareham, Moxon Dolphin & Kerby Ltd., 178-202 Great Portland Street, London W1N 6TB, or telephone him on 01-637 3289. Replies will be forwarded direct to our client. Please list in a separate note any companies to whom you do not wish your application sent.

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D.P. OPPORTUNITIES NORTHERN HOME COUNTIES - EAST ANGLIA (0279) 506464

IBM COBOL Programmer (2 yrs.+) £8,000+
Analyst/Programmer (3 yrs.) to £11,000
DEC/ASSEMBLER to £10,500
Senior ICL/COBOL Programmer to £12,000
Senior Analyst/Design on IBM System 34 to £11,000
Systems Programmer (IBM VSE/VSAN/CICS) to £11,000
ICL COBOL Programmer (6 months+) £8,500+
Senior Programmer/Analyst (2 yrs. COBOL + FILETAB) to £11,000
Field Service Engineer (DEC exp.) to £9,500 + car + benefits
O & M Analyst (3 yrs. exp.) to £9,500
Senior Programmer (5 yrs. COBOL + CICS) to £9,500
Senior Analyst (In depth; ideally ICL exp.) to £10,000
Field Service Engineers (2 yrs. exp. minis & micros) to £7,500 + car

To discuss these and other opportunities please telephone your local office 9 a.m. to 6 p.m. out of hours answering service

Bishop's Stortford 0279-506464

ata COMPUTER RECRUITMENT



AIRLINE INDUSTRY DATA PROCESSING PROJECT LEADER

Geneva-based international organisation seeks DP professional with extensive data processing experience in the area of international airline tariffs data to supervise team responsible for all systems related to the processing of fares, rates and mileage information.

Candidate must have a minimum of six years' programming/analysis experience and be fully familiar with all aspects of the appropriate application areas. Thorough knowledge of FORTRAN and COBOL in IBM OS or UNIVAC 1100 environment is required. Must be able to communicate with users and DP staff at all levels. Previous experience in a supervisory position would be an asset.

This position offers a unique opportunity for a person with an interest in this area to play a major role in the provision of tariffs data to the airline industry.

Interviews will be conducted in London week of March 22.

Detailed curriculum vitae should be received at the following address no later than March 18.

International Air Transport Association
Greener House
88/88 Haymarket
London SW1Y 4RF

(0769)

UMIST

MICROELECTRONICS APPLICATIONS UNIT (MAU) PROGRAMMING COURSES MICROPROCESSOR SOFTWARE DESIGN COURSE

6 and 7 April, 1982 (Course Ref. C0074/13)

A 2-day Course for Engineers and Programmers

This new course is designed for the engineer and/or programmer who already uses microprocessor systems and who wishes to improve his/her software design methods. The course consists of a series of lectures covering the various aspects of microprocessor software design with particular emphasis on program design, which is explained through the use of a problem orientated PASCAL-like notation. No previous knowledge of PASCAL is assumed.

Cost, including lunches and refreshments, is £180.

For further details contact:

The Registrar (Special Courses), UMIST, P.O. Box 88, Sackville Street, Manchester M60 1QD. Tel: 061-275 3311, Ext. 2713. Telex: 660084.

(0601)

TAMESIDE METROPOLITAN BOROUGH COMPUTER DEPARTMENT

An ICL 2966 Computer has recently been installed running under DME/GEORGE 3, shortly to be replaced by an ICL 2966 under CME. The Authority has an extensive computer development plan.

To implement this and assist in conversion to VME we require:

(A) **2 SYSTEMS ANALYST/PROGRAMMERS**
(New Posts) £8951-£9693 p.a.

At least 3 years' COBOL programming and one year's experience in Systems Analysis.

(B) **1 SENIOR PROGRAMMER**

£7371-£9528 p.a. according to experience.
At least three years' COBOL programming.

Candidates must also have extensive experience of either GEORGE 3 or VME operating systems.

Application forms and further details from Chief Personnel Officer, Council Offices, Wellington Road, Ashton-under-Lyne, Greater Manchester OL5 8DL to be returned by the 16th March, 1982.

(0800)

TOP RATES

UNIVAC COBOL DMS/TIP (APRIL)
VAX FORTRAN (NOW)
UNIVAC 1100 FORTRAN (NOW)
VM, MVS, CICS, IMS, SYS, PROGS. (MAY/APR)
BASIS DATABASE (NOW)
API PROGRAMMERS (NOW)
HIGH LEVEL DATABASE OR COMMUNICATIONS CONSULTANTS (MAY, JUNE, JULY, STARTS)
UTS 400 PROGRAMMER (NOW)
UNIVAC 9020 COBOL/IMS (NOW)
OS/VS1, SYS, PROG. (NOW)

MONTREAL ASSOCIATES SYSTEMS
01-583 2944 (4 lines) Emp. Agcy.

(0760)

UK SERVICE ENGINEERING MANAGER

We are an expanding systems company with a growing number of Apple II, terminal, printer and hard disk based installations in the field.

If you are an experienced Service Engineer capable of establishing a Hardware Support function and located ideally in the Midlands or Reading area we would like to hear from you. Some software knowledge would be an additional plus. Attractive salary and benefits package.

Please apply to: DAVID BAKER, TD1 RECRUITMENT, 29 AIMA YALE ROAD, SLIPTON, BRISTOL BS4 2HL or 0272 742766.

(0804)

CONTRACTS

**Middle East. Tax free
+ bonus and benefits***
UK contracts also available

We have contract positions open with our clients now and additional people will be needed throughout 1982. Contact us now to register. Current vacancies are for people with extensive IBM Experience.

Programmers + Analyst Programmers

MARK IV - Financial Systems
PL1 and COBOL - Experience of Payroll + TSO/SPF and JCL
MARK IV - Industrial Systems, knowledge of Data Base + Utilities
FORTRAN - For Engineering applications, knowledge of MVS.
PL1 and COBOL - Material Supply Systems using IMS.

Business Analysts

People with substantial experience as Business Analysts are required for the UK and Saudi Arabia. Applications include: Housing Management Systems, Transportation Systems and Material Supply Systems. Experience of both batch and on-line systems required.

Also required

Instructors, Software Librarian,
Systems Programmers and Change Control Analysts
For most positions we will require at least three years relevant experience. Middle East contract benefits include:

- * Five-day working week
- * Excellent recreational facilities
- * Regular return flights
- * Overtime payments
- * Meal allowances
- * Free accommodation etc.

PERMANENT UK

Management Consultants required for Central London location with ability to communicate at a very senior level. Five figure salary. We also have current requirements for permanent staff to work in the Essex area.

Contact Mike Mead at
International and Middle East
Recruitment Specialists,
Princess Caroline House,
1 High Street, Southend-on-Sea,
Essex SS1 1JE
or telephone Southend-on-Sea (0702) 333816
(24-hr answering service).

IMERS

MVS Systems Programmer

Holland £2500/month

A senior MVS Systems Programmer, with good communications skills, is required initially for 1 year to act in a senior adviser/technical support role with a client running multiple CPUs with MVS SP1, MSNF, ACF/VTAM and an in-house DB/DC facilities. Whilst participating in all activities, emphasis will be on planning, performance, problem resolving and training.

8001

COBOL/BAL/CICS

Brussels £2100/month

A Programmer with at least 3 years experience, is required, initially for 3 months, to tailor a financial package to a clients requirements and then assist with implementation and testing. Applicants should have a solid experience of COBOL and either macro-level CICS or command-level CICS with Assembler. A knowledge of DOS/VSE or VM/CMS would be an advantage.

1002

CDs IBM Systems Programming and DB/DC Specialists

CDs is an Anglo-Swiss Consultancy specialising in systems programming and DB/DC application development. For further details of the above positions or for an informal discussion on future European or UK assignments please contact Mike Shive at our UK office on 0276 61808 during evening/weekends.

CDs Limited, 67-73 Park Street, Camberley, Surrey GU15 3PE. Tel. 0276 25845 Telex 858062

(0630)

Systems Analyst

NORWICH

Nacanco Ltd is the UK subsidiary of the National Can Corporation of Chicago, U.S.A. We have recently installed an IBM 4341 computer which includes a telecommunications network and uses VM/CMS and DB/VS1.

Our requirement is for an experienced Systems Analyst to play a major role in the development of new and revised on-line applications. This is a position of responsibility within the data processing department.

The successful applicant will have had a significant involvement in the investigation, design and successful implementation of at least one major project. Experience in a manufacturing industry would be advantageous.

Salary will be commensurate with the experience offered and assistance will be given with relocation expenses to the Norwich area if necessary.

Applicants should send career details including current and expected salary to: Data Processing Manager, Nacanco Ltd, Salthouse Rd, Norwich NR7 8AT.

Nacanco Limited

(0674)

SENIOR PROGRAMMER ANALYST TECHNICAL SUPPORT

CIRCA £12,000 p.a.

The OASIS group who develop and support Data Processing Systems for International Banking offices require a Senior Programmer Analyst to join their Applications Programming Technical Support Team.

The OASIS Group (Overseas Automation Support for International Systems) operates from attractive air-conditioned offices beside the Thames using IBM 4300 hardware in a VM, DOS/VSE, VSAM environment utilising CICS and DL/1.

WE REQUIRE A SENIOR PROGRAMMER ANALYST WHO WILL HAVE:

- ★ A minimum of five years' programming experience (COBOL)
- ★ Design and implementation experience using the following:
Command Level CICS
Call DL/1
Data Structured programming techniques
- ★ The candidate will have previous experience at a team leader level in the establishment of standards and procedures for programming.

WE OFFER THE SUCCESSFUL CANDIDATE:

- ★ An attractive salary
- ★ Profit-sharing scheme
- ★ Structured career progression
- ★ 5% house loan
- ★ Low interest personal loans
- ★ Non-contributory pension schemes
- ★ Free staff restaurant

The successful applicant will be responsible for providing technical assistance to the programming teams, ensuring quality of program development, the adherence to standards and the development and evaluation of programming aids.

If you have the experience, are forward thinking and enjoy a challenge phone Ray French, on 01-600 5666 or apply to OASIS Manufacturers Hanover Trust Co, Queensbridge House, 60 Upper Thames Street, London EC4.

(0741)

**MANUFACTURERS HANOVER
TRUST COMPANY**



Computer Operators

London W1.

£7,000+15% shift bonus

The company is a major employment agency operating twin Honeywell 64DPS4 computers running TDS on-line systems with possibly the largest communications network in the U.K. on this type of machine.

Applicants should be in their early 20's, educated to 'O' level standard or higher and having two to three years computer operating experience including at least 6 months on Honeywell 64DPS systems under GCOS 1D. Starting salary £7,000 plus 15% shift bonus.

Please apply enclosing details of career to date, to Mrs Joan Lindh, Atred Marks Bureau, Adia House, 84/86 Regent Street, London W1R 5PA.

(0711)

ALFRED MARKS BUREAU

ANALYST/PROGRAMMER READING, BERKSHIRE

Inter Innovation a leading Swedish manufacturer of banking systems is currently in an expansion phase and are seeking an Analyst/Programmer to take care of the rapid growth in our systems business.

The person appointed will have project responsibility from inception through feasibility analysis, specification, programming, testing, documentation to implementation. Applicants male or female, should possess a degree/HNC plus at least 3 years' experience in banking or a related systems area.

We offer a competitive salary, first class conditions of employment in a dynamic environment.

If you feel you have the right qualifications and would like to work in this challenging field please write with career details to:

Mr. L. J. Shardlow
Inter Innovation Limited
84 Oxford Road
Reading, Berkshire



(0732)

Commercial Systems Analyst/Programmer

Progressive Environment
West Country

£8/9,000

Independent Chemists Marketing is responsible for the development and maintenance of a wide range of services for UK retail and wholesale chemists including advanced computer systems. We now need to expand our team based in Warrminster by appointing an Analyst/Programmer who will have the opportunity of working on a number of challenging projects including point-of-sale and microcomputer applications.

The successful applicant will have general systems experience and knowledge of COBOL, and will be prepared to undertake responsibility for all aspects of a project.

Age and specific machine experience are less important than ability and commitment. An attractive salary is offered, together with relocation assistance where necessary, and other benefits.

Please write, giving brief details of experience and qualifications to:

The Company Secretary
Independent Chemists Marketing Ltd
51 Boreham Road
Warrminster
Wilts BA12 9JU
Tel: 0985 215588



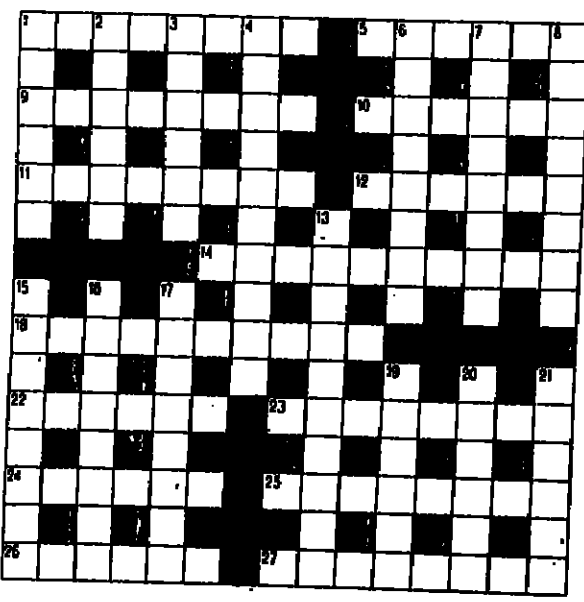
(0907)

CROSSWORD

Prize Crossword No 26

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, by first Post Friday, March 12. Please use a ballpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name..... (Miss, Mrs, Ms, Mr)

Address.....

Telephone.....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed..... Date.....

ACROSS

1. Musical sounds appear to unfold reversed figure in retreat (8)
5. Girl has to cut down very fast pace (6)
9. Leave him? Look - how disgusting! (8)
10. Redhead shows mettle (6)
11. Rude bankrupt, without first sign of virtue (8)
12. What organiser of detective branch did? It's foul (6)
14. Happen to do best in exam, ahead of idiot (4,2,4)
18. A directors' joint on deck? (6,4)
22. Tasty stew made from chaff, abroad (6)
23. Greek article pocketed by one Scotswoman (8)
24. Repositor (as below ground level for wine (6)
25. Sort of hedge made by nimble group (8)
26. Volunteers pulled back in far time, getting tidden (6)
27. A dealer to deal with when in credit (8)

DOWN

1. Soft cake made by miss at home (6)
2. Player of string instrument, awfully bristly, losing head (6)
3. Attractive young girl embraces king in a funny way (6)
4. Encourage a proposal of health with a snack (3,2,5)
6. A soldier thanks an eminece, one who stirs things up (8)
7. Record here in France, an expert at reasoning (4,2,4)
8. Blessed abode is exhibited in display (8)
13. Make contact, as a football may do when kicked out (3,2,5)
15. Crazy outfit gets a student to give a song (8)
16. Nag collapses in a critical moment - it's pathetic (8)
17. Foreign miss in funeral embarrassed (8)
19. During Easteride, a conscientious clergyman (6)
20. Casually metallic stuff lets in wind (6)
21. Joiner gets most of the train fixed up (6)

RULES AND CONDITIONS

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly with the exception of the staff of IPC Business Press Ltd, any printers employed by them, or the near relatives of any such staff.
3. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.
4. Winners will receive their prizes during the month following the competition.
5. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

ANALYST/PROGRAMMERS

WORKING £7-9K NEG

HP 3000/III (Upgrade probable)

We require additional persons with HP experience to join our team implementing an Order Processing system using COBOL, IMAGE and VIEW.

Roger Choat
JAMES WALKER & CO. LTD
LION WORKS, MAYBURY HILL
WOKING, SURREY GU22 8AP
Telephone: Woking 5961

THE HATFIELD POLYTECHNIC
SCHOOL OF ENGINEERINGLECTURER IV/SENIOR
LECTURER IN
ELECTRONIC/
INFORMATION
ENGINEERING
(Re-advertisement)

Candidates should have an Honours Degree in an appropriate discipline and recent relevant industrial and/or research experience is desirable. Applications from those with experience in information engineering will be particularly welcomed. The successful candidate will be required to teach on degree, diploma and post-experience short courses and will be expected to develop research and consultancy activities. Salary between £6,675 and £11,641.

Application forms and further details may be obtained from the Staffing Officer, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Herts. AL10 9AB, or telephone Hatfield 88100 extension 309. Please quote Ref: 482. Closing date: 19 March, 1982. (8731)

OXFORD POLYTECHNIC
COMPUTER CENTRE
OPERATIONS ANALYST

Applications are invited for the post of Operations Analyst. The successful applicant will lead a team of operators responsible for the Centre's computers. Equipment installed includes IBM 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3090, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3101, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 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